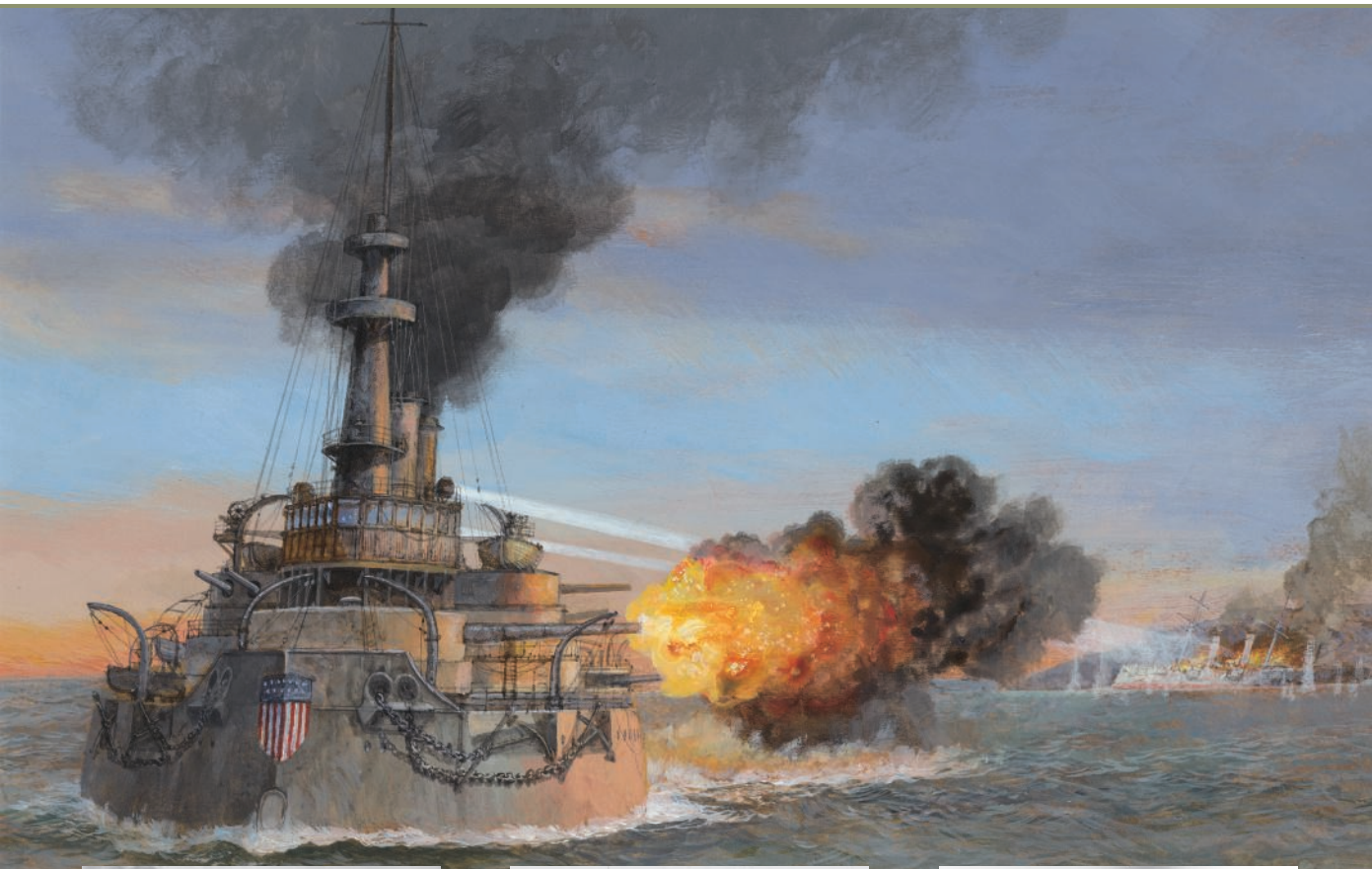
US NAVY BATTLESHIPS 1886–98

The pre-dreadnoughts and monitors that fought the Spanish-American War



BRIAN LANE HERDER

ILLUSTRATED BY P. WRIGHT, F. RODRÍGUEZ, AND A. GILLILAND

NEW VANGUARD 271

US NAVY BATTLESHIPS 1886–98

The pre-dreadnoughts and monitors that fought the Spanish-American War

BRIAN LANE HERDER

ILLUSTRATED BY P. WRIGHT,
F. RODRÍGUEZ, AND A. GILLILAND

CONTENTS

INTRODUCTION 4

DESIGN AND DEVELOPMENT 5
- The New Navy
- Construction
- US pre-dreadnought weapons

LARGE MONITORS 1874–1903 11
- USS *Puritan* (1896)
- Amphitrite class (1891–96)
- USS *Monterey* (1893)
- Arkansas class (1902–03)

SECOND-CLASS BATTLESHIPS 1886–95 17
- USS *Maine* (1895)
- USS *Texas* (1895)

FIRST-CLASS BATTLESHIPS 1889–97 24
- Indiana class (1895–96)
- USS *Iowa* (1897)

OPERATIONAL HISTORY 32
- The *Maine* disaster, February 15, 1898
- The Spanish-American War, April–August 1898
- The Pacific and Asiatic 1898–1900
- Twilight careers 1903–56

CONCLUSION 46

SELECT BIBLIOGRAPHY 47

INDEX 48

US NAVY BATTLESHIPS 1886–98

The pre-dreadnoughts and monitors that fought the Spanish-American War

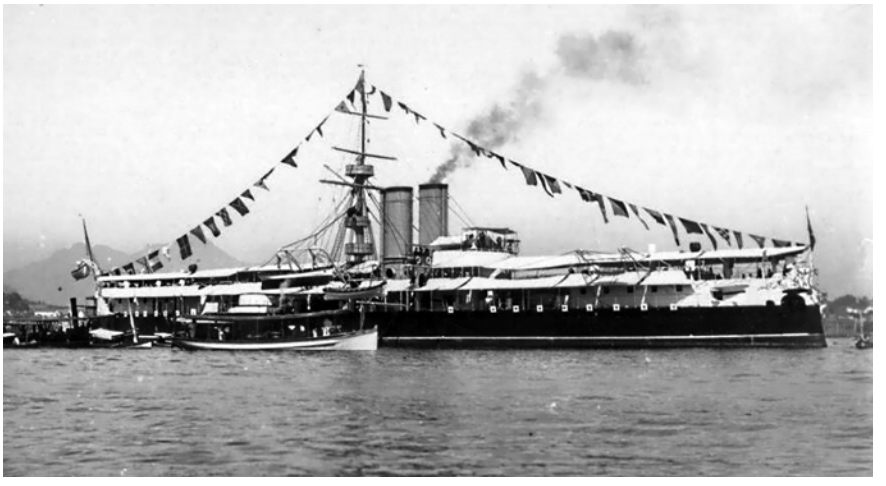
INTRODUCTION

In 1865 the United States Navy (USN) had boasted one of the largest and most technologically advanced fleets in the world. But with the Confederate insurrection crushed, the USN was aggressively dismantled. The young wartime volunteers were discharged, returning the *antebellum* USN's aging, reactionary officer corps to prominence. Within two years, the civilian Secretary was returning naval funds to the Treasury. By the 1870s, the USN was a feeble shell of its former self, an object of domestic and international scorn. Junior officers reported professional embarrassment when hosting their foreign counterparts. It would take international events to convince politicians the USN was a national security liability.

In October 1873, Spain captured the American-flagged blockade runner *Virginius*, which had been illegally smuggling weapons to Cuban revolutionaries. Coincidentally, the Spanish ironclad *Arapiles*, superior to any US warship, was drydocked at New York at the time. Spanish authorities summarily executed 53 American and British prisoners as pirates, only finally stopping when threatened with imminent Royal Navy bombardment. The decrepit USN had been powerless to intervene. "We knew long before that," a young officer wrote, "that our so-called naval force was a sham."

Despite its vast economic power, the United States' foreign policy pretensions would again prove feckless when trying to force a resolution to the 1879–83 War of the Pacific between Chile, Peru, and Bolivia. The Garfield administration was forced to back down because, in the words of an Ohio congressman, the USN "had not one ship that could stand 15 minutes against any one of the great Chilean war vessels." In 1882, false rumors that the Chilean fleet was approaching had gripped California in a statewide panic. A US admiral declared, "The Chilean navy could have stood three miles beyond the range of the best guns we have at the Golden Gate and dropped 500lb shells into the heart of San Francisco."

In November 1883, Brazil commissioned the British-built *Riachuelo*, a modern 5,029-ton steel battleship boasting four 9.2in guns. Alabama congressman Hilary A. Herbert warned, "If all this old navy of ours were drawn up in battle array in mid-ocean and confronted by the *Riachuelo* it is doubtful whether a single vessel bearing the American flag would get into port." Then on April 28, 1885, US gunboats intervening in the Panamanian insurgency suddenly received a frosty visit from Chile's state-of-the-art,



The Brazilian ironclad battleship *Riachuelo*, seen in 1885. The sudden appearance of powerful South American warships such as the Armada Nacional's *Riachuelo* and the Armada de Chile's *Esmeralda* provoked the United States into responding with its own battleships. (Public domain/ Wikimedia Commons)

British-built 2,950-ton protected cruiser *Esmeralda*. After USN officers toured the cruiser, an American publication announced, "The *Esmeralda* could destroy our whole navy, ship-by-ship, and never be touched once." The House Naval Affairs Committee declared, "We are not only at the mercy of foreign nations, but our neighbor, Brazil, might exact tribute of any city along our Gulf or Atlantic coast while Chile could enforce similar demands on the shores of the Pacific." Increasingly lurid language described *Riachuelo* and her sister *Aquidabã* leisurely cruising off Coney Island while raining shells on downtown New York. Domestic opposition to a modern, battleship-armed US Navy began to fade.

DESIGN AND DEVELOPMENT

The New Navy

By 1880, the United States' Civil War debt had been paid off and $100 million sat in the US Treasury. The following year, President Garfield's Navy Secretary, William H. Hunt, convened the 15-member Rodgers Board to study building a contemporary steel Navy. In 1883, Congress approved three small cruisers and a dispatch boat (*Atlanta*, *Boston*, *Chicago*, and *Dolphin*), inaugurating a technological and cultural renaissance that would lead the USN into its current modern era. The virtually brand-new institution that emerged by the 1898 Spanish-American War would informally be called the Steel Navy, or simply the New Navy.

The New Navy also established institutions to further professional development and promote freer exchange of ideas. Officers had already founded the civilian Naval Institute in 1876. Its journal *Proceedings* provided an open forum for officers and civilians to debate naval issues, free from the trappings of rank or career. The Navy Department established the Office of Naval Intelligence in 1882, followed by Commodore Stephen Luce's Naval War College (NWC) at Newport, Rhode Island, in 1884. From this intellectual nerve center, the USN would develop and disseminate its strategies and doctrines for modern warfare.

Americans had traditionally associated battleships and battle fleets with the imperialist pretensions of European great powers. The United States

On September 22, 1896, Indiana citizens presented the battleship *Indiana* with a Tiffany silver service and an American flag, seen here. The gifts accompanied *Indiana* throughout her career, including at Santiago. They are now on display at the Indiana War Memorials in Indianapolis, having been returned to the state in June 1922. (Indiana War Memorials)

had never built a modern battleship and had only ever commissioned nine wooden ships-of-the-line in its entire history; these fine vessels had then mostly languished in reserve. American naval strategy had historically emphasized *guerre de course* – wearing down an enemy by destroying its wealth-making commerce. However, American commerce raiding had never proven decisive to winning a war, nor did it protect against an aggressor's descent on the United States. The 1883 appearance of Brazil's *Riachuelo* decisively reoriented USN intellectual thought towards active sea control.

The newly accepted theories became most strongly associated with a single 1880s NWC professor, Alfred Thayer Mahan. Mahan preached that the most efficient way a navy could protect its nation was on offense. A single concentrated battle fleet should be assembled to seek out and destroy its enemy counterpart on the high seas, far from American shores. Afterwards, the enemy's commerce could be raided and its coastline blockaded at will. Mahan and his fellow reformers proved successful in converting American politicians to their ideas. By 1889, Secretary of the Navy Benjamin F. Tracy would declare proper US strategy was "to divert an enemy's force from our coast by threatening his own, for a war, though defensive in principle, may be conducted most effectively by being offensive in its operations." The new strategy required a concentrated fleet of battleships rather than the independently operating cruisers (frigates) of the traditional sailing USN. While expensive, capital ships carry unique prestige as symbols, making battleship names in a federal republic inevitably political. Indeed, 1819 federal law already mandated that all "first-class" warships be named after "the States of this Union," a powerful inducement for battleships by Congress, which operated on state patronage.

Construction

In 1873, the Royal Navy commissioned HMS *Devastation*, a 9,180-ton sea-going ironclad boasting turreted 12in guns and full steam power. *Devastation*'s basic arrangement established the general outline of future battleships. By 1885, some 34 battleships had been launched or were under construction by European yards. Congress could have bought its battleships from Europe, but instead required they be built in the United States. Political patronage played a part, but so too did a sincere desire to build up the manufacturing base of a still-developing nation. Before the New Navy, the United States lacked a peacetime market that rewarded investing in heavy manufacturing plant specialized to high-technology hardware. Modern armor plate, cannon, and high-performance machinery were beyond the primitive 1880s American steel industry, which produced large amounts of mild steel for railroad rails, but little else. A US military-industrial complex did not yet exist.

In 1883, the joint Army-Navy Gun Foundry Board began investigating methods of domestic gun and armor production. After touring European firms and examining various private-public European set-ups, the board recommended American private enterprise supply the material and a federal gun factory at the Washington Navy Yard finish the weapons. Work began

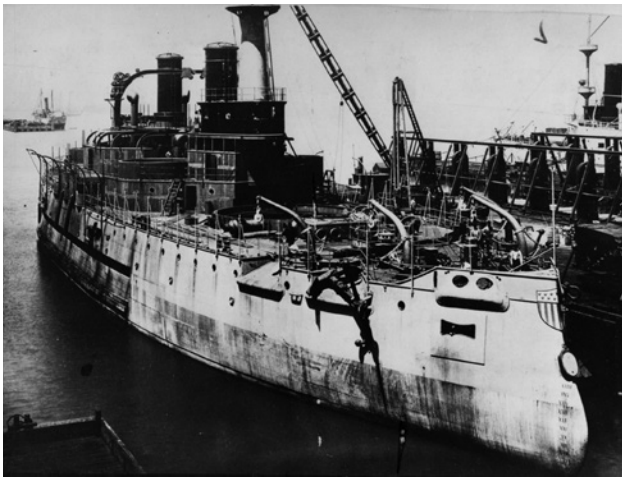
on the Washington, DC naval plant in 1886. That same year, Bethlehem Iron bought the United States' first heavy forging plant from Britain's Whitworth Company. Bethlehem additionally purchased technical expertise from the French firm Schneider-Creusot, the world leader in armor manufacturing technology. On June 1, 1887, the USN awarded Bethlehem an exclusive $3.6 million deal for 1,310 tons of semi-finished gun forgings and 4,500 tons of armor plate for the United States' first two battleships, *Maine* and *Texas*, plus the incomplete monitors *Puritan*, *Amphitrite*, *Monadnock*, and *Terror*. Construction began on Bethlehem's heavy forging plant in 1888. By late 1890, Bethlehem was delivering gun forgings to the USN, but armor production fell behind – Whitworth's heavy casting and forging equipment had been delivered a year late, while sophisticated armor-forging techniques proved difficult to quickly master. After intense negotiations, Pittsburgh's Carnegie Steel agreed to produce USN armor at its Homestead Steel Works, giving Benjamin F. Tracy his desired commercial competition. Tracy awarded Carnegie a contract for 6,000 tons of armor plate in 1890.

Enlisted sailors of the battleship *Massachusetts* are seen at mess; they both ate and slept here on the berth deck. Behind them a casemated 6in/40-caliber gun is visible. Contemporary American society viewed peacetime military service with some disdain; foreigners consequently made up a significant proportion of USN enlisted strength. (LOC)

Early ironclads had been protected by wrought iron armor, but in 1876 Schneider-Creusot had developed an oil-quenched mild steel plate 25 percent stronger than pure iron. Steel plate was nevertheless prone to cracking. By casting or cementing steel to an iron backing, compound armor was produced combining steel's face-hardness with iron's toughness. By 1889, Schneider-Creusot had begun secretly experimenting with nickel additives, finding an optimum 4 percent nickel content materially increased all-steel plate's strength and toughness. Then in 1890, Harvey steel was developed in the United States. The Harvey process carburized steel by burying plate in 2,100-degree F bone charcoal for two to three weeks, chilling with a precise regimen of oil- and water-quenching, and finishing with a final annealing. The result was a super-hardened steel face with a tough backing.

Armor type	Thickness equivalent to 12in steel plate
Harvey	7.5in
Nickel-steel	11.5in
Compound	12in
Wrought iron	15in
Coal	24ft

In 1890–91, Tracy conducted intensive shell-firing tests, firing 8in rounds at various types of armor plate at point-blank range. Harvey armor emerged the clear winner. The Navy Department cornered $1 million of Canadian nickel and began incentivizing production of Harveyized nickel-steel armor at federal expense. By 1893, Bethlehem and Carnegie had been awarded a combined $12.3 million to produce 19,947 tons of armor. American mills were shortly producing high-quality gun forgings, armor plate, and steel propeller shafts that just a few years earlier could only be made in Europe. By 1895, a visiting British ordnance expert proclaimed Bethlehem "superior to any gun factory in the world."



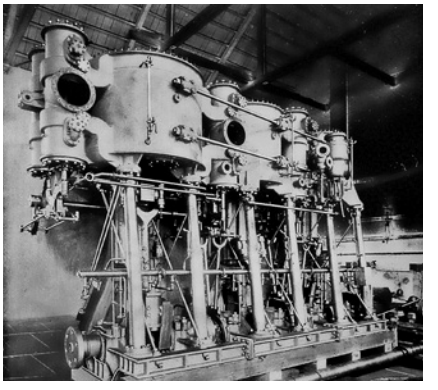
Some 100,000 San Francisco Bay spectators reportedly turned out to witness *Oregon*'s October 26, 1893, launching. She is seen fitting out at Union Iron Works on July 17, 1894. Despite growing larger and more sophisticated, average battleship construction time fell from 79 months for *Maine* and *Texas* to 57 months for the Indiana-class ships and finally 46 months for *Iowa*. (NHHC NH 75013)

Battleships were designed around an armored central citadel protecting the main battery, magazines, conning tower, and machinery. A thick armored belt shielded the waterline. Armored transverse bulkheads provided the citadel's front and back, while an armored deck provided horizontal protection against the era's mild plunging fire. The combined effect was an armored box. Ironclads had employed an "all-or-nothing" armor scheme as solid shot rarely caused critical damage to peripheral areas. However, newly invented medium-caliber explosive shells were highly destructive, demanding light armor extensions beyond the citadel to detonate rounds before they pierced soft ends or superstructure. US battleships employed watertight compartments and outboard cellulose cofferdams packed with ground-up corncobs. When punctured and exposed to inrushing water, the cellulose theoretically swelled to seal the hole. In practice this proved ineffective and the material inevitably rotted. Inboard the cofferdams were coal bunkers; 2ft of coal was judged equivalent to 1in steel armor.

USS *Indiana* (BB-1)	**Tons**	**Percentage**
Design (normal) displacement	10,296	100
Hull	4,400	42.7
Rivets	700	6.8
Hull + rivets	5,100	49.5
Armor	2,700	26.2
Machinery	875	8.5
Armament	413	4
Ammunition	400	3.9
Design coal	400	3.9
Full coal	1,597	13.9

All US battleships and monitors employed twin screws. The earlier monitors were powered by horizontal or inclined compound engines, described by a *Puritan* engineer as "interesting chiefly as objects of antiquarian investigation." The battleships and final monitors were powered by vertical triple-expansion (VTE) reciprocating steam engines, first installed aboard battleship HMS *Inflexible* in 1876. A single VTE was mounted to a crankshaft attached to all three cylinders by the pistons' connecting rods. Steam from coal-fired fire-tube cylindrical boilers (Scotch boilers) was routed through each cylinder sequentially, allowing power to be extracted from the same exhaust multiple times. Forced draft improved VTE efficiency by using blowers to pressurize ash pits or preferably the entire fire room.

Auxiliary machinery operated capstans, winches, hoists, blowers, ventilator fans, air compressors, dynamos, and ice machines. When commissioned in 1895, the battleship *Indiana* employed an assortment of 86 auxiliary engines. Auxiliaries were usually steam-driven and inefficient, consuming up to 20 percent of total power. Hydraulic auxiliaries employed



FAR LEFT
Firemen, known as the black gang, stoke *Massachusetts*' boilers in the forced draft fire room. Stoking was inevitably hot, filthy, and back-breaking work. The Indiana-class ships and *Iowa* employed double-doored airlocks to keep their fire rooms pressurized. (LOC)

LEFT
One of *Massachusetts*' two 4,500hp vertical triple-expansion (VTE) reciprocating steam engines is seen at its Philadelphia factory. High, intermediate, and low-pressure cylinder diameters were 34.5in, 48in, and 75in respectively; total piston stroke was 42in. Each VTE extended over three decks. (Public domain/ Wikimedia Commons)

distilled water – messy but much safer than steam. In 1883, the USN introduced below-decks electric lighting. By 1896, electricity's superior efficiency and precision led to it powering increasing amounts of auxiliary machinery such as searchlights, signal lights, and electric motors for winches, cranes, fans, ash and shell hoists, and sundry turret gear. Armored tubes protected voice-pipes, electrical wiring, turret hoists, and auxiliary piping to the turrets. Below-decks ventilation, rarely adequate, was supplied by cowls and auxiliary fans. Battleships necessarily required internal communications; *Indiana*'s were facilitated by 21 sets of speaking tubes, 12 telephone stations, and numerous electric call-bells. "Wig-wag" flag signaling provided daytime ship-to-ship communication; nighttime signaling demanded the Ardois system of red and white lamps. Long-ranged communication employed red and green Very flares, while *Massachusetts* would participate in the USN's first at-sea wireless telegraphy experiments in 1899.

US pre-dreadnought weapons

The paramount difference between pre-dreadnought battleships and all-big gun battleships was the range at which they expected to fight. By 1898, US battleships employed Bradley Fiske's newly developed system of electric range finders, electric range transmitters, range indicators, and main gun telescopic sights, increasing battle range to 2,000 yards – still within small-caliber range. Each gun was controlled by its own gunner or gun captain, little changed since the days of sail. Coordinated batteries, centralized fire control, and salvo spotting were neither possible nor necessary until the all-big gun battleship arrived.

Contemporary battleships generally employed three basic batteries: a main battery of heavy, very slow-firing breech-loading guns (typically 12in/40-caliber) for smashing the thickest armor, a secondary battery of faster-firing 6in medium-sized guns, and a lightweight, mixed tertiary battery of fixed-shell cartridge semi-automatic cannons and fully-automatic machine guns to smother superstructures in a "hail of fire" and massacre exposed enemy personnel topside.

Advanced European metallurgy progressively adapted quick-acting breech mechanisms and semi-fixed brass shell cartridges to ever-larger calibers. By 1892, both France and Britain had developed 6in quick-firing (QF) guns firing five to seven high-explosive shells per minute, known as rapid-firing (RF) guns in USN parlance. BL came to mean "bag-loading," referring to non-RF guns only. By the mid-1890s, modern European

ABOVE LEFT
A view inside *Massachusetts*' 13in Mark 2 double turret. Partially unburnt propellant bags and comparatively dirty-burning powder left heavy post-firing residue to be cleaned out before the next shot. Unscientific loading processes and cumbersome breechblocks meant 1890s heavy guns might fire one round every five minutes. Nominal range was 12,000 yards but hits were not expected beyond 2,000 yards. (LOC)

ABOVE RIGHT
Four bluejackets pose with their 6-pdr gun aboard USS *Massachusetts*, sometime between 1896 and 1901. A 6-pdr could fire 20 57mm rounds per minute. The 6lb projectile could penetrate 2in of steel at 1,000 yards. (LOC)

battleships typically mounted a 6in RF secondary battery that could both repulse torpedo boat attacks and also wreck enemy battleships' secondary batteries. However, domestic US industry could only manufacture slow-firing 6in BL guns; fixed-cartridge, 6-pdr (57mm) RF guns provided American anti-torpedo boat defense. Intended for fighting tops, boats, and landing parties were semi-automatic and revolving 1-pdrs (37mm) along with .45–70 Gatling guns; the Gatlings, however, were quickly replaced by the Colt-Browning M1895 machine gun. US battleships could deploy significant ground forces; *Texas*' naval infantry battalion was armed with 250 M1895 6mm Lee Navy rifles, 147 Colt M1892 New Navy .38 revolvers, and one 3in/21-caliber Mark 1 RF field gun. Additionally, tradition and physical training/recreation demanded *Texas* carry 72 Civil War-era M1860 cutlasses.

American 1890s naval guns employed prismatic brown powder (or "cocoa powder") which burned slower than earlier black powder thanks to chemical improvements and specially milled, shaped grains. Slower-burning propellant meant a longer, smoother projectile acceleration, increasing range and accuracy while reducing barrel wear. Superior smokeless powder, based on the French *Poudre B*, was introduced in 1900. It completely replaced brown powder by 1905, although its full effect was limited by short 1890s gun barrels. Powder-handling was inherently risky; although double-stage ammunition hoists had been introduced in Europe, all 1890s US monitors and battleships employed single-stage turret hoists lacking flash protection.

US battleships were additionally armed with the self-propelled torpedo, invented in 1866 by Englishman Robert Whitehead. In 1870, USN Lieutenant Commander John Howell had developed the 14in Howell Mark 1 torpedo. Congressional and USN apathy meant production only began in 1889, by the Hotchkiss Ordnance Company. Only 50 were ever produced. In 1892, the E.W. Bliss Company secured American manufacturing rights to the 18in Whitehead Mark 1 torpedo, which became the US standard.

Heavy guns			
Type	**Projectile**	**Muzzle velocity**	**Firing rate (nominal)**
13in/35-caliber BL	1,130lb armor-piercing (AP)	2,100ft/sec	1rd/5 min
12in/35-caliber BL	870lb	2,100ft/sec	1rd/5 min
12in/40-caliber BL	870lb	2,800ft/sec	1rd/1.5 min
10in/30-caliber BL	510lb AP	2,000ft/sec	1rd/1.5 min
10in/34-caliber BL	510lb AP	2,000ft/sec	1rd/1.5 min
8in/35-caliber BL	260lb AP	2,100ft/sec	1rd/1.5 min

Light guns			
Type	**Projectile**	**Muzzle velocity**	**Firing rate (nominal)**
6in/30-caliber BL	105lb	2,000ft/sec	1rd/1.2 min
6in/40-caliber BL	105lb	2,150ft/sec	1rd/1.2 min
4in/40-caliber RF	33lb	2,000ft/sec	8–9rds/min
3in/50-caliber RF	13lb	2,700ft/sec	15–20rds/min
Hotchkiss/Driggs-Schroeder 6-pdr (57mm)	6lb	1,818ft/sec	25rds/min
Hotchkiss/Driggs-Schroeder 1-pdr (37mm)	1lb	2,000ft/sec	25rds/min
Maxim-Nordenfelt 1-pdr (37mm) autocannon	1lb	1,818ft/sec	300rds/min

Anti-personnel guns			
Type	**Projectile**	**Muzzle velocity**	**Firing rate (nominal)**
Gatling .45–70 revolving gun	405-grain	2,020ft/sec	1,500rds/min
Colt-Browning M1895 6mm machine gun	112-grain	2,560ft/sec	450rds/min
Colt-Browning M1895 .30–40 machine gun	100-grain	2,898ft/sec	450rds/min
Lee Navy M1895 6mm rifle	112-grain	2,560ft/sec	(Straight-pull bolt action)
Colt M1892 .30 revolver	125-grain	772ft/sec	(Double-action revolver)
3in/21 Mark 1 RF field gun	13lb	1,150ft/sec	8–9rds/min

Self-propelled torpedoes						
Type	**Weight**	**Length**	**Warhead**	**Propulsion**	**Range**	**Speed**
Howell Mark 1 14in torpedo	580lb	11ft, 0in	100lb wet guncotton	130lb flywheel spun at 10–12,000 rpm	400 yards	25 knots
Whitehead Mark 1 18in torpedo	845lb	11ft, 8in	118lb wet guncotton	1350psi compressed air into 3-cylinder reciprocating engine	800 yards	26.5 knots

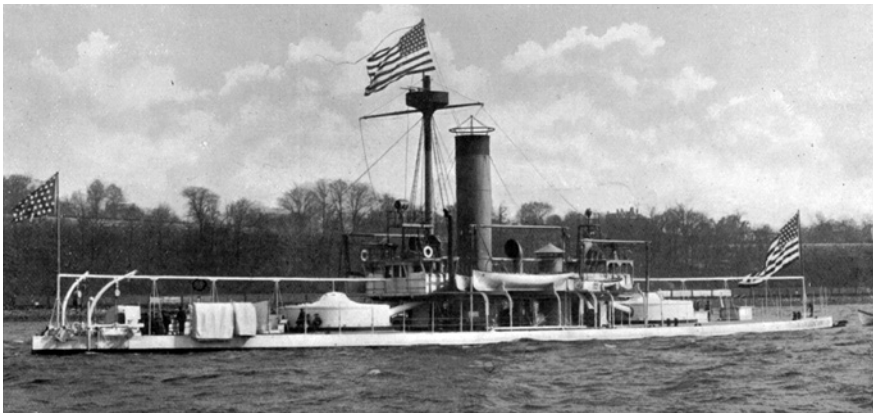
LARGE MONITORS 1874–1903

The New Navy monitors were distinctively American, being fiscal, technological, and philosophical relics of the Civil War. The type was derived from John Ericsson's original USS *Monitor* of 1862. *Monitor* had introduced a severely low freeboard, making her difficult to target but producing a notoriously unseaworthy ship; she sank in heavy seas just ten months into commission. The New Navy monitors resembled European coast defense battleships in that they were fitted with battleship guns and armor but were unfit for deep-sea operations. The large monitors' quasi-battleship status would be officially recognized in 1920 by the USN's retroactively assigned BM (battleship, monitor) hull type designator.

Briefly inspired by the 1873 *Virginius* war scare, on June 23, 1874, Congress had authorized the refurbishment of five dilapidated, twin-

OPPOSITE
A rough-looking *Oregon* gunner demonstrates proper operation of a 1-pdr for the camera; his weapon discharged 25 37mm rounds per minute. In battle he would be targeting his enemy counterparts, who would find themselves equally exposed operating small-caliber weapons at close range. (LOC)

Launched in 1876, ten years before her sisters, *Miantonomoh* most closely recalled the Civil War-era monitors in appearance and technology. She was commissioned in 1891, four years earlier than any other Robeson monitor. *Miantonomoh* is seen in 1897 still painted in her peacetime scheme. (US Navy)



turreted Civil War-era monitors – the ocean-going *Puritan* and the four smaller Miantonomoh-class ships. In an impressive accounting shell game, Secretary of the Navy George Robeson surreptitiously scrapped the five existing monitors and nine other decrepit ships and instead funneled the combined savings, proceeds, and Congressional appropriations into five brand-new monitors cunningly given identical names: *Puritan*, *Amphitrite*, *Terror*, *Monadnock*, and *Miantonomoh*. The USN officially maintained they were the original ships. The monitors would be built at civilian yards, as no government yards remained capable of their construction. Robeson awarded *Puritan* and *Miantonomoh* to Chester, Pennsylvania's Roach, *Amphitrite* to Wilmington, Delaware's Harlan and Hollingsworth, *Terror* to William Cramp & Sons at Philadelphia, and *Monadnock* to Phineas Burgess' Vallejo, California start-up shipyard. Brooklyn's Continental Shipyard of original *Monitor* fame had refused a ship contract but agreed to supply parts.

Miantonomoh was launched on December 5, 1876. Total monitor funding, however, fell $2.3 million short. With the USN $7 million in debt, incoming Secretary of the Navy Richard W. Thompson declared Robeson's contracts illegal in 1877 and suspended further work. Saddled with incomplete, unwanted hulks in their slips, the idle, unpaid civilian yards were compelled to fund the monitors' upkeep for the federal government. The vessels languished unfinished in a cesspool of government corruption, inefficiency, and apathy over the following decade. Burgess declared bankruptcy, ultimately winning a $129,311.45 government settlement. By 1881, Secretary William H. Hunt dismissed the monitors as "simply bad copies of old models. To continue these vessels would be to introduce a

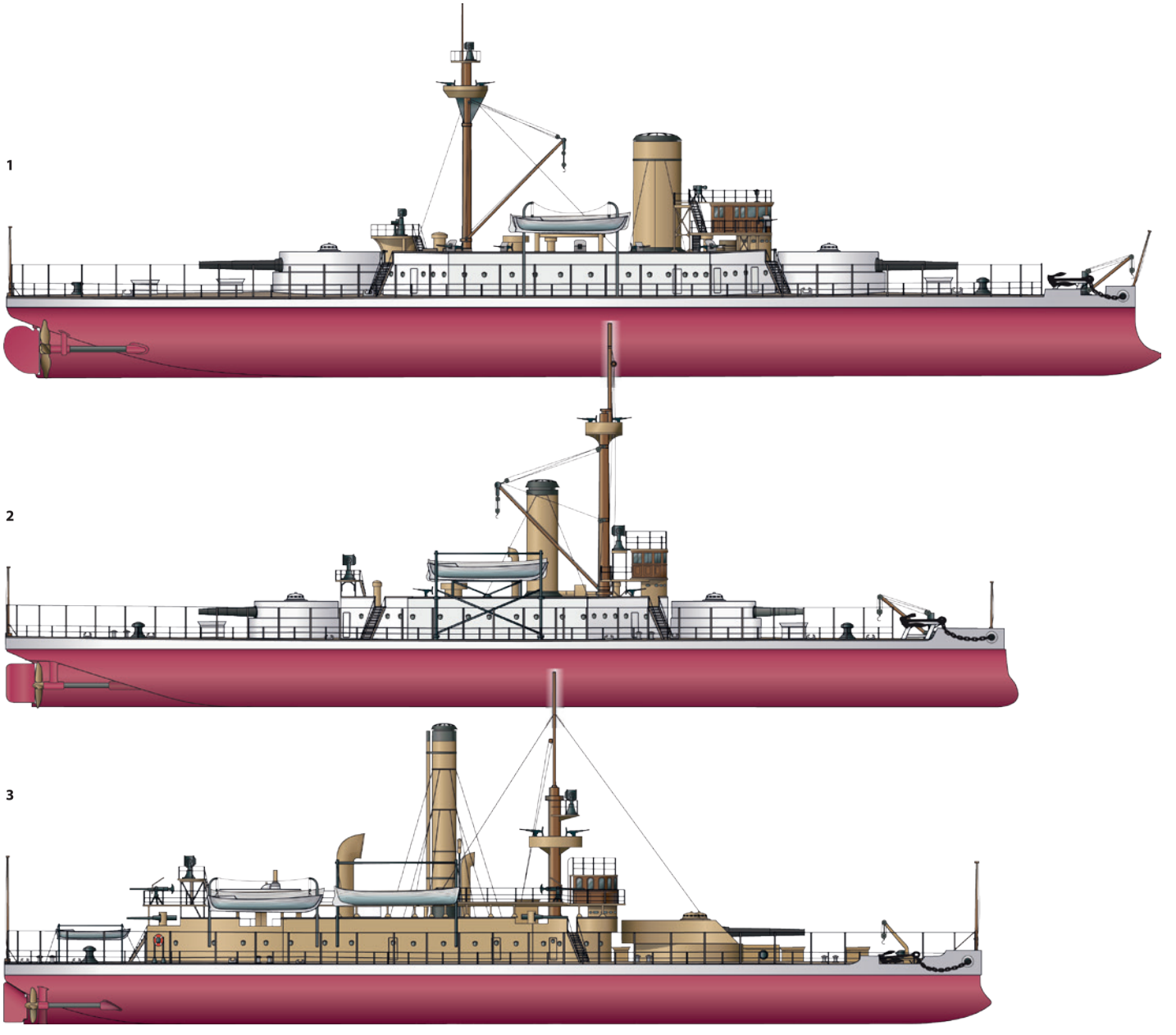
A

NEW NAVY MONITORS

1: USS *Puritan* (BM-1) is viewed shortly after her December 1896 commissioning. After seeing action in 1898, *Puritan* served in auxiliary and training roles before her 1910 decommissioning. She was stricken in 1918. A late 19th-century British admiral claimed monitors like *Puritan* resembled "full-armored knights riding on donkeys – easy to avoid but bad to close with."

2: USS *Amphitrite* (BM-2) appears in 1897. While certainly uncomfortable to serve aboard, monitors in general may have been overly victimized by a hostile USN culture that openly despised harbor defense. As late as 1916, an anonymous senior USN officer made a compelling case in newsprint for brand-new 14in gunned monitors.

3: USS *Wyoming* (BM-10) as she appeared in 1903. Congress authorized the Arkansas-class as either single- or double-turreted; the USN chose a single-turreted design. The Arkansas monitors were well-built and fitted with modern equipment.


1
2
3

USN HULL TYPE DESIGNATORS

Beginning in 1895, US battleships and monitors were designated "Battleship No. 1" (*Indiana*), "Battleship No. 2" (*Massachusetts*), "Monitor No. 1" (*Puritan*), "Monitor No. 2" (*Amphitrite*), etc., abbreviated to "B-1," "M-1," and so on. This system was replaced in 1920 by the current multi-letter type/subtype format. Thus, battleship *Indiana* became BB-1 (Battleship, Battleship, No. 1) and monitor *Puritan* BM-1 (Battleship, Monitor, No. 1). *Maine* was again retroactively designated an armored cruiser (ACR-1). *Texas* uniquely never received a designation.

worthless class into the Navy." However, the "floating flatirons" were to be finished "solely as a choice of evils." In 1882, Congress appropriated $400,000 to launch and transfer them to Navy yards. The following year, $1 million was allocated for machinery, but in 1884, Congress again suspended construction, then paid contractors $200,000 in 1885 as compensation. Finally, the August 3, 1886, naval bill appropriated $8 million and ordered the monitors finished.

USS *Puritan* (1896)

In 1877, the USN accused Roach of corruption and examined the unfinished *Puritan*. At 7,200 tons, *Puritan* was unable to float, being 1,000 tons overweight. Actual workmanship, however, was judged superb. Work resumed in fits and starts, beginning in 1882, when *Puritan* was towed to the Brooklyn Naval Yard. A June 1889 board heavily altered *Puritan*'s design. The main battery would be four barbette-mounted 12in/35-caliber guns firing 870lb shells. Additional superstructure increased crew accommodations and provided a secondary battery platform. Deleting two boilers saved 85 tons. Completion was further delayed by Bethlehem's armor plate troubles. USS *Puritan* (Monitor No. 1, or BM-1) was finally commissioned in December 1896, over 22 years after she was laid down. At 6,060 tons, she was over six times larger than *Monitor*.

Puritan-class Construction

Ship	Laid down	Yard	Completed	Yard	Authorized	Launched	Commissioned	Fate
Puritan (BM-1)	Philadelphia, PA	Roach & Sons	Brooklyn, NY	Brooklyn Naval Yard	Jun 23, 1874	Dec 6, 1882	Dec 10, 1896	Sold 1922

USS *Puritan* (BM-1) specifications	
Length:	296ft, 3in
Beam:	60ft, 1.5in
Draft:	18ft (mean)
Displacement:	6,060 tons
Propulsion:	Horizontal compound engines, eight boilers
Speed:	12.4 knots at 3,700ihp
Coal capacity:	410 tons
Armament:	Four 12in/35-caliber BL rifled guns in two turrets
	Six 4in/40-caliber RF guns
	Six 6-pdrs, four 1-pdrs
Protection:	Turrets: 8in
	Sides: 14in
Complement:	28 officers, 208 enlisted

Amphitrite class (1891–96)

In 1883, *Amphitrite*, *Terror*, and *Monadnock* were towed to the Norfolk, Brooklyn, and Mare Island Navy Yards respectively; *Miantonomoh* steamed to Brooklyn under her own power. A major 1886 redesign finalized the *Amphitrites*' main battery at four 10in/30-caliber guns firing 510lb AP (armor-piercing) shells. Completed underweight at 3,815 tons, the ships themselves differed greatly in detail. Commissioned first in 1891, USS *Miantonomoh* (BM-5) possessed spare upperworks and was constructed with 2,240 tons of English armor, armament, and steel plate as American steel had still been unavailable.

USS *Amphitrite* (BM-2), *Monadnock* (BM-3), and *Terror* (BM-4) were commissioned in 1895–96. They were fitted with Bethlehem nickel-steel armor and built-up superstructures resembling Britain's breastwork monitors. *Amphitrite* employed hydraulic auxiliaries, *Terror* pneumatics, and *Miantonomoh* and *Monadnock* steam. Like *Puritan*, the Amphitrites were finished with their original and wholly obsolete 1870s-era powerplants. Engineering ventilation was abominable, sometimes reaching 200 degrees F. During an 1895 cruise, so many engineers were incapacitated that *Amphitrite* drifted to a complete stop. Habitability was subsequently improved by installing additional ventilators.

Monitor USS *Amphitrite* seen in an 1897 photochrom color postcard by the Detroit Publishing Company. *Amphitrite* heavily toured the East Coast from her April 1895 commissioning until the outbreak of the Spanish-American War in 1898. (Public domain/Wikimedia Commons)

Amphitrite-class Construction

Ship	Laid down	Yard	Completed	Yard	Authorized	Launched	Commissioned	Fate
Amphitrite (BM-2)	Wilmington, DE	Harlan & Hollingsworth	Portsmouth, VA	Norfolk Naval Yard	Jun 23, 1874	Jun 7, 1883	Apr 23, 1895	Scrapped 1952
Monadnock (BM-3)	Vallejo, CA	Burgess	Mare Island, CA	Mare Island Naval Yard	Jun 23, 1874	Sep 19, 1883	Feb 20, 1896	Sold 1923
Terror (BM-4)	Philadelphia, PA	Cramp & Sons	Brooklyn, NY	Brooklyn Naval Yard	Jun 23, 1874	Sep 19, 1883	Feb 20, 1896	Sold 1921
Miantonomoh (BM-5)	Chester, PA	Roach & Sons	Brooklyn, NY	Brooklyn Naval Yard	Jun 23, 1874	Dec 5, 1876	Oct 27, 1891	Sold 1922

Amphitrite-class specification

Length:	259ft, 6in
Beam:	55ft, 10in
Draft:	14ft, 6in (mean)
Displacement:	3,815 tons
Propulsion:	(*Amphitrite*) Inclined compound engine, four Babcock & Wilcox boilers
	(*Monadnock*) Horizontal triple expansion engine, four single-ended boilers
	(*Miantonomoh*, *Terror*) Inclined compound engine, six boilers
Speed:	10.5 knots at 1,600ihp
	(*Monadnock*) 12 knots at 3,000ihp
Range:	1,370nm at 10 knots
Coal capacity:	270 tons (*Monadnock*, 386 tons)
Armament:	Four 10in/30-caliber BL rifles in two double turrets (360 rounds)
	(*Miantonomoh*) Two 10in/30-caliber BL rifles and two 10in/34-caliber rifles
	Two 4in/40-caliber RF guns
	Two 6-pdrs, four 1-pdrs
Protection:	Nickel-steel (*Miantonomoh*, compound armor)
	Sides: 5–7in
	Deck: 1.75in
	Turrets: 11.5in
Complement:	26 officers, 145 enlisted

Monitor USS *Monterey* berthed at Mare Island Navy Yard in August 1897. An initial *Monterey* design armed her with a 16in gun, a 12in gun, a 15in Zalinksy pneumatic dynamite gun, and 16 rapid-firing guns, but USN calculations revealed *Monterey* would have been unable to float. (US Navy)

USS *Monterey* (1893)

Monterey (BM-6) was authorized in 1887 to reinforce the Pacific Squadron. She was laid down at San Francisco's Union Iron Works in December 1889 and commissioned on February 13, 1893, beating all but *Miantonomoh* into service. Displacing 4,084 tons, USS *Monterey* was intended as an improved *Amphitrite*. Her modern VTE powerplant developed 5,244hp, resulting in a top speed of 13.6 knots. *Monterey* was armed with two 12in/35-caliber guns in her forward turret and two 10in/30-caliber guns in her after turret. When filled, water-ballast tanks could reduce *Monterey*'s combat freeboard to mere inches. Like all monitors, *Monterey* was allegedly a heavy roller, interminably wet, and miserably hot in tropical climates.

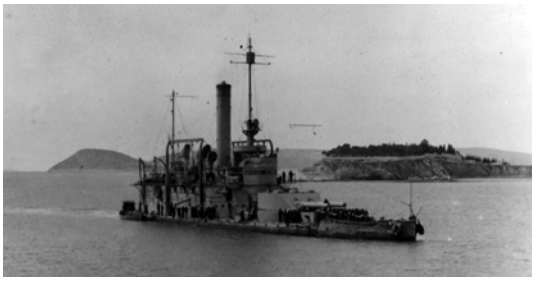
Monterey-class Construction

Ship	Built at	Yard	Laid down	Launched	Commissioned	Fate
Monterey (BM-6)	San Francisco, CA	Union Iron Works	Dec 20, 1889	Apr 28, 1891	Feb 13, 1893	Sold 1922

USS *Monterey* (BM-6) specifications

Length:	256ft
Beam:	59ft, 0.5in
Draft:	14ft, 10in (mean)
Displacement:	4,084 tons
Propulsion:	Two VTEs, four Babcock & Wilcox boilers
Speed:	13.6 knots at 5,244ihp
Coal capacity:	230 tons
Armament:	Two 12in/35-caliber BL rifles
	Two 10in/30-caliber BL rifles (180 rounds)
	Six 6-pdrs, four 1-pdrs, two .45–70 Gatlings
Protection:	Turrets: 8in
	Sides: 13in
Complement:	19 officers, 172 enlisted
Cost:	$2.07 million

Arkansas-class monitor USS *Tonopah* (ex-*Nevada*) viewed at Spolato, Yugoslavia (present-day Split, Croatia) in 1919. *Tonopah*'s quasi-battleship heritage is quite apparent; her slab-sided superstructure, sloped-armor 12in turret, and low freeboard present a formidable appearance. (US Navy)



Arkansas class (1902–03)

In April 1898, public uproar at a seemingly undefended East Coast compelled the USN to temporarily reactivate worthless 1860s monitors merely to calm the populace. That October, Congress authorized four brand-new monitors for harbor defense, although the USN had deemed the type and mission obsolete almost 20 years earlier. Displacing 3,235 tons, the resulting Arkansas-class mounted two 12in/40-caliber guns forward in a modern sloped-armor Mark 4 turret along with a secondary battery of four 4in/40-caliber RF guns. The new monitors also boasted extensive electric machinery and advanced water-tube boilers.

Arkansas (BM-7) and *Wyoming* (BM-10) were commissioned in 1902, followed by *Nevada* (BM-8) and *Florida* (BM-9) in 1903. They were stripped of their state names in 1908–09 and renamed *Ozark* (BM-7), *Tonopah* (BM-8), *Tallahassee* (BM-9), and *Cheyenne* (BM-10). It was *Nevada*'s third name in nine years; she had been launched in 1900 as *Connecticut* (BM-8). The four unwanted monitors with the expendable names would nonetheless provide diverse and often valuable service.

Arkansas-class Construction						
Ship	**Built at**	**Yard**	**Laid down**	**Launched**	**Commissioned**	**Fate**
Arkansas (BM-7)	Newport News, VA	Newport News Shipbuilding	Nov 14, 1899	Nov 10, 1900	Oct 28, 1902	Sold 1922
Nevada (BM-8)	Bath, ME	Bath Iron Works	Apr 17, 1899	Nov 24, 1900	Mar 5, 1903	Sold 1922
Florida (BM-9)	Elizabeth, NJ	Crescent Shipyard	Jan 23, 1899	Nov 30, 1901	Jun 18, 1903	Sold 1922
Wyoming (BM-10)	San Francisco, CA	Union Iron Works	Apr 11, 1899	Sep 8, 1900	Dec 8, 1902	Sold 1939

Arkansas-class specifications	
Length:	252ft
Beam:	50ft
Draft:	12ft, 6in
Displacement:	3,235 tons
Propulsion:	Two VTEs, four water-tube boilers
Speed:	12 knots at 1,739ihp
Range:	2,360nm at 10 knots
Coal capacity:	350 tons
Armament:	Two 12in/40-caliber BL rifles in one Mark 4 turret
	Four 4in/40-caliber RF guns
Protection:	Turrets: 10in
	Sides: 8in
	Deck: 1.5in
Complement:	13 officers, 135 enlisted
Cost:	$1.1 million

SECOND-CLASS BATTLESHIPS 1886–95

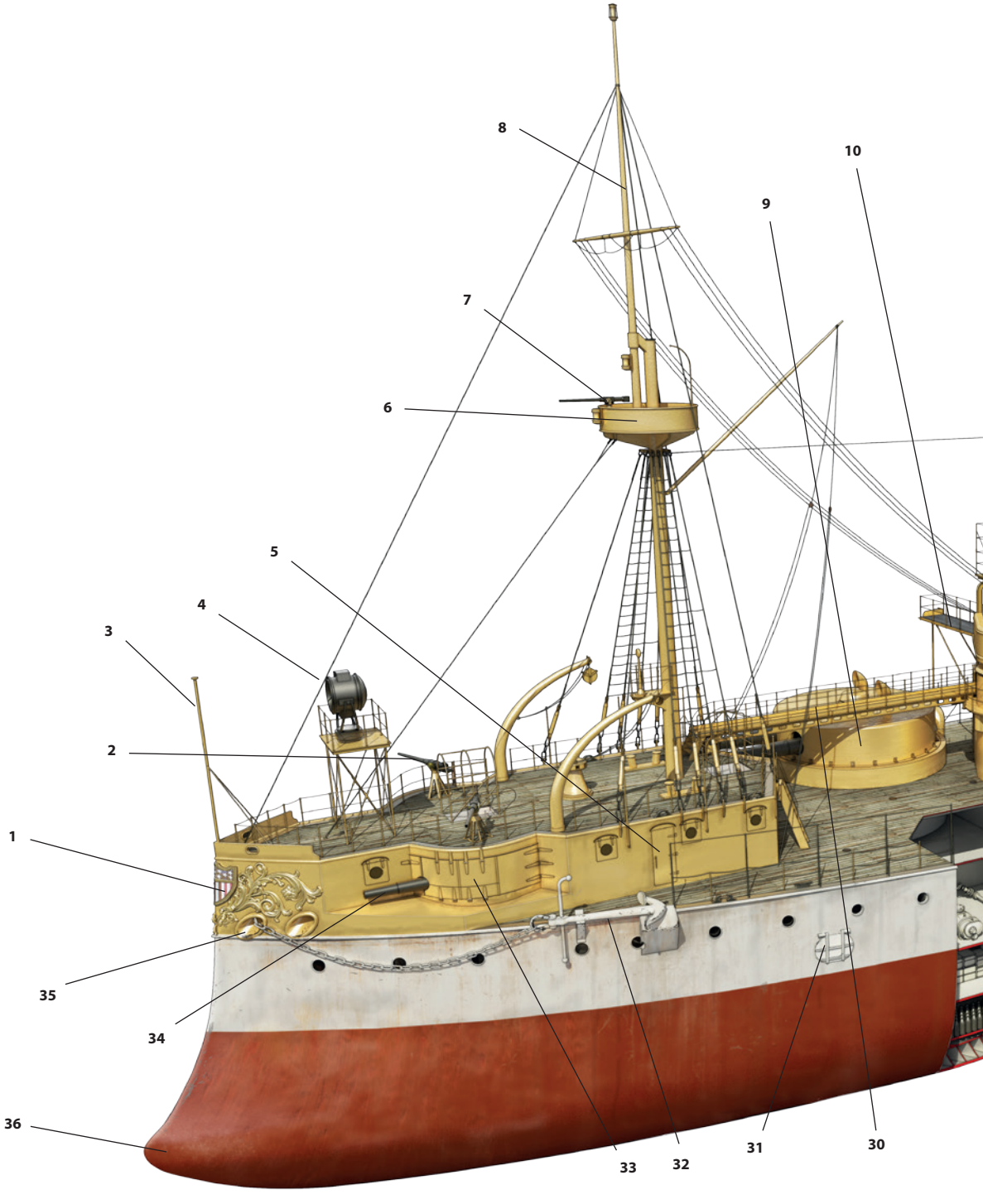
In 1885, the USN's Bureau of Construction & Repair forwarded designs for a 7,500-ton battleship and 5,000-ton armored cruiser. Secretary of the Navy William Collins Whitney ultimately requested two 6,000-ton warships from Congress. On July 24, 1886, the House Naval Affairs Committee recommended the construction of an "armored cruising and battle ship" superior to a monitor but not mistakable for any "heavily armored vessel … designed for the line of battle," as this might suggest a rivalry with European powers. Congress authorized a 6,000-ton armored cruiser and 6,000-ton battleship on August 3, 1886, requiring both be built in the United States and at least one be designed by an American.

The armored cruiser *Maine* was originally designed with two-thirds barque sail for long-range deployments. Battleship *Texas* eschewed range

B

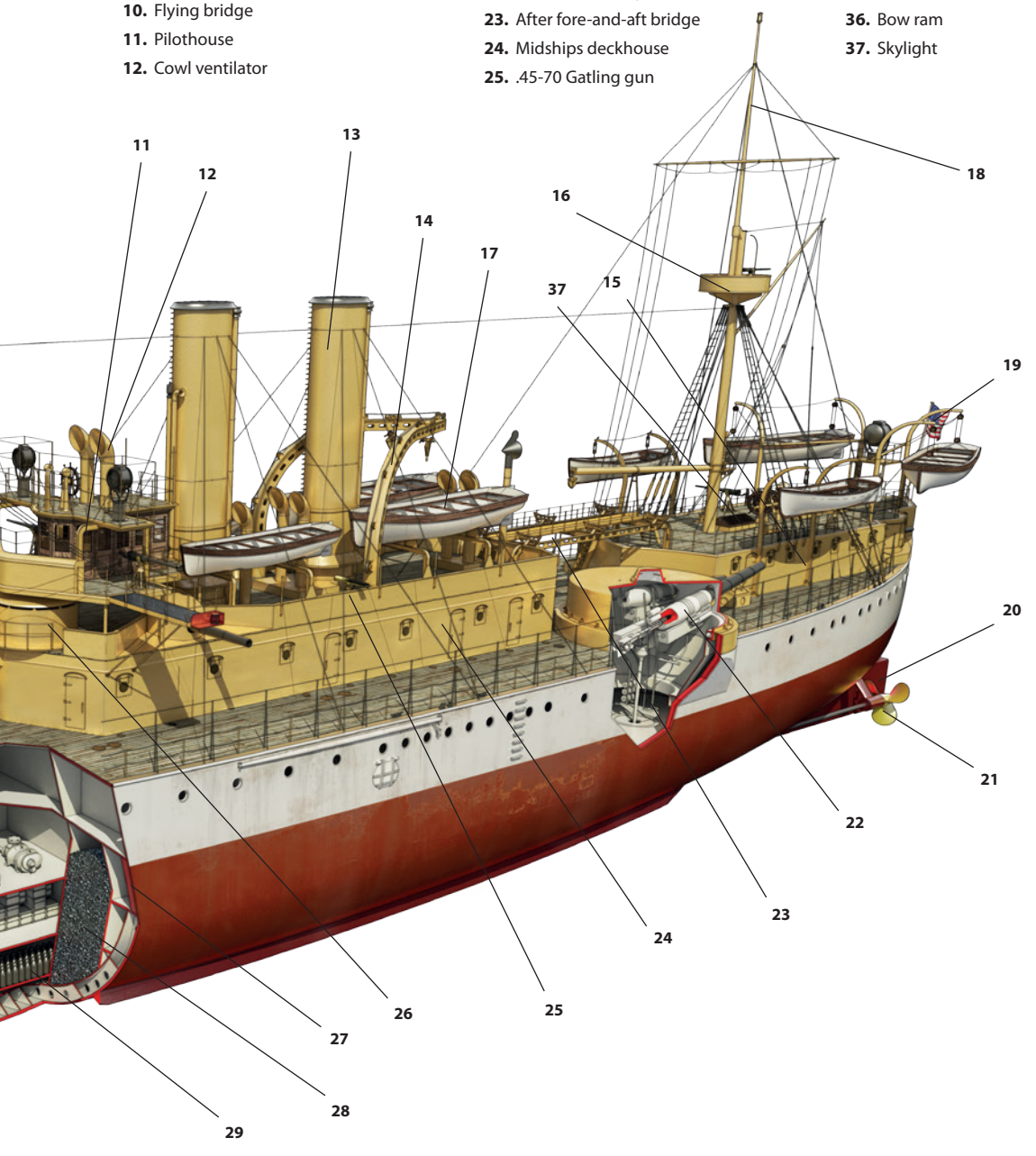
SECOND-CLASS BATTLESHIP USS *MAINE* (ACR-1)

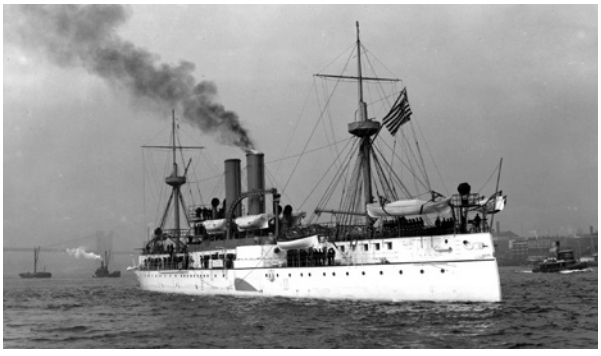
Originally designated an armored cruiser, *Maine* was commissioned on September 17, 1895, a year after being redesignated a Second-Class Battleship. Her distinctive echeloned main battery turret arrangement can be seen. This portside view reveals the location of *Maine*'s fateful bow magazine detonation on February 15, 1898.



BATTLESHIP USS *MAINE* (ACR-1)

1. Union shield bow ornament
2. Driggs-Schroeder 6-pdr gun
3. Jackstaff
4. Searchlight
5. Forward deckhouse
6. Forward fighting top
7. Hotchkiss/Driggs-Schroeder 1-pdr gun
8. Foremast
9. 10in Mark 3 gun turret
10. Flying bridge
11. Pilothouse
12. Cowl ventilator
13. Funnel
14. Midship boat crane
15. After deckhouse
16. Aft fighting top
17. Boats/launches
18. Mainmast
19. Naval ensign
20. Rudder
21. Screw
22. 10in/30-caliber gun
23. After fore-and-aft bridge
24. Midships deckhouse
25. .45-70 Gatling gun
26. Conning tower
27. Armor belt
28. Coal bunker
29. 10in magazine
30. Forward fore-and-aft bridge
31. 18in Whitehead torpedo tube
32. Anchor
33. 6in casemate
34. 6in/30-caliber gun
35. Hawsepipe
36. Bow ram
37. Skylight





Maine seen from her stern quarter in New York's East River. *Maine* was the first of nine battleships built at the New York Navy Yard between 1888 and 1944. She served in the North Atlantic Squadron throughout her 29-month career. (LOC)

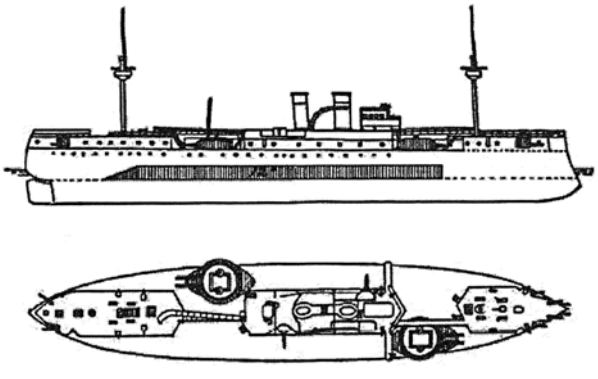
for heavier armor and larger guns. *Maine* and *Texas* were designed with a ram bow, as were all US battleships well into the dreadnought era. Ironclads had resurrected ramming as a naval tactic in the 1860s, emphasizing end-on fire. In 1873, the Italian Duilio-class battleships had introduced the echeloned battery, theoretically capable of firing in any direction through separated, minimal superstructures. The staggered battery arrangement was adopted for many following designs, including *Riachuelo*, *Maine*, and *Texas*. *Maine*'s design circular mandated her main battery be "so arranged so as to obtain the greatest command, both horizontal and vertical, consistent with other essential conditions, and must afford a heavy bow and stern fire." In practice, firing arcs proved limited, as muzzle blast damaged decking and upperworks.

France and Britain perfected 6in RF guns during *Maine*'s and *Texas*' protracted seven-year construction period, making ramming attacks and echeloned batteries obsolete. In February 1890, the newly established Board on Construction requested *Texas* be totally redesigned for centerline turrets, but work was already too advanced. In 1894, the USN accordingly redesignated both *Maine* and *Texas* as "Second-Class Battle Ships." *Maine*'s and *Texas*' all-or-nothing armor plans had also become vulnerable to recently developed medium-caliber high-explosive shells. Although clearly superior to their originally planned South American opponents, by *Maine*'s and *Texas*' 1895 commissionings the USN had refocused to countering European battle fleets. The United States' first two battleships were already out of date.

USS *Maine* (1895)

Maine's starboard 10in turret was echeloned forwards, while her portside 10in turret was echeloned astern. The battleship required awkward cut-outs to mount the 10in turrets a deck lower than originally planned to reduce topweight. *Maine*'s waterline belt and downward-sloping stern protective deck can be seen. (Author's collection)

Designed by European-trained Theodore D. Wilson of the USN Bureau of Construction & Repair, *Maine* (Armored Cruiser No. 1, or ACR-1) was laid down at the Brooklyn Navy Yard in October 1888 and commissioned on September 17, 1895, as a second-class battleship. At 6,682 tons and a top speed of 16.5 knots, she was larger and more powerful than contemporary armored cruisers, mounting four 10in/30-caliber guns in twin hydraulically powered Mark 3 turrets. *Maine* additionally mounted six 6in/30-caliber BL guns and four above-water 18in Whitehead torpedo tubes. Her machinery was built by N.F. Palmer, Jr. & Company's Quintard Iron Works in New York. *Maine*'s 135psi vertical triple-expansion engines were the first in a US warship and employed forced draft via closed ash pits. Two 16kw dynamos powered 500 interior lamps and six searchlights.



A 180ft, 12in thick nickel-steel belt protected *Maine*'s waterline. A 6in nickel-steel transverse bulkhead provided the forward end of the armored box. The protective deck extended forward, reinforcing *Maine*'s bow ram, but sloped downwards towards the stern and below the waterline, shielding steering gear and propeller shafts.

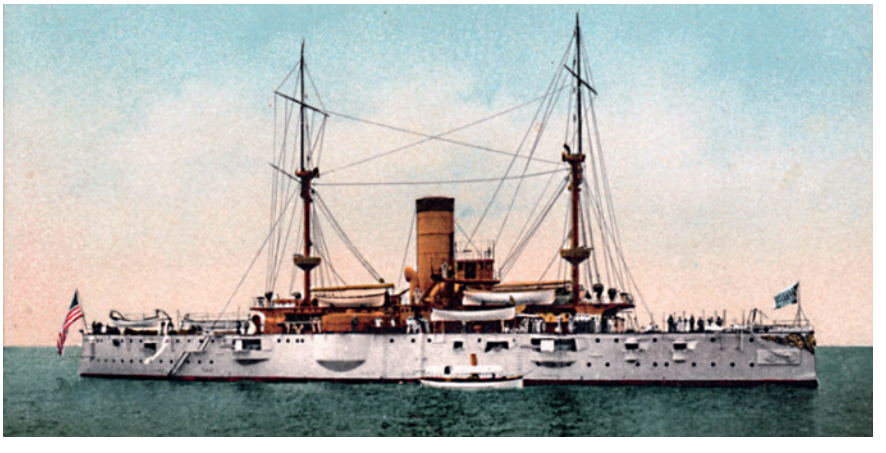
Maine was intended as an offensively oriented "super-cruiser" for overseas operations, but the USN deleted her sails during construction and advised overseas coaling stations be established instead. *Maine* spent her brief career with the North Atlantic Squadron.

Maine-class Construction						
Ship	**Built at**	**Yard**	**Laid down**	**Launched**	**Commissioned**	**Fate**
Maine (ACR-1)	Brooklyn, NY	Brooklyn NY	Oct 17, 1888	Nov 18, 1889	Sep 17, 1895	Destroyed by explosion Feb 15, 1898

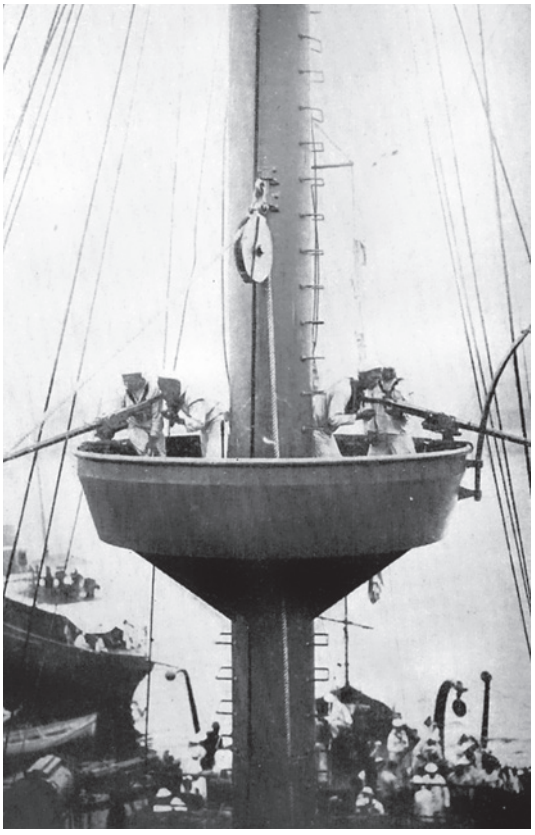
USS *Maine* (ACR-1) specifications	
Length:	318ft
Beam:	57ft
Draft:	21ft 6in
Displacement:	6,682 tons
Propulsion:	Two VTE engines, eight single-ended fire-tube boilers
Speed:	16.45 knots at 9,293ihp
Range:	Radius 3,600nm at 10 knots
Coal capacity:	896 tons
Armament:	Four 10in/30-caliber BL rifles in two double turrets (360 rounds)
	Six 6in/30-caliber BL rifles
	Seven Driggs-Schroeder 6-pdrs, eight Hotchkiss/Driggs-Schroeder 1-pdr guns, four .45–70 Gatlings
	Four above-water 18in Whitehead torpedo tubes (eight torpedoes)
Protection:	Belt: (nickel-steel) 7–12in
	Forward bulkhead: 6in
	Conning tower: 10in
	Barbettes: 10–12in
	Turrets: 8in
	Deck: 2–3in
Complement:	31 officers, 343 enlisted
Cost:	$4.68 million

USS *Texas* (1895)

Texas was designed by William John of Britain's Naval Construction and Armament Company of Barrow-in-Furness. John's $15,000 prize from the



A colorized 1907 postcard of battleship *Texas* in peacetime colors. The American South was still recovering economically and psychologically from the Civil War and the Virginia-built "Southern battleship" *Texas* was a source of regional pride. (Public domain/The University of Houston Digital Library)



Bluejackets man two 1-pdr guns in a *Texas* fighting top, August 1898. In battle they expected to rain automatic fire onto exposed enemy personnel below. The scene is virtually identical to one from Trafalgar but is just a few years from extinction. (Public domain)

US government was disputed by Barrow, which claimed the prize was owed the company. John left over the controversy, and *Texas*' detailed plans were ultimately drawn up by Barrow's A. D. Bryce Douglas. Although laid down after *Maine* on June 1, 1889, *Texas* was commissioned first on August 15, 1895. At 6,315 tons, *Texas* was small by international standards, but at 17.8 knots was the fastest early US battleship.

Main armament comprised two 12in/35-caliber guns, firing 870lb shells. Mounted singly in sponsoned, hydraulically powered turrets, the forward 12in/35 echeloned to port while the after 12in/35 echeloned to starboard, the opposite of *Maine*. The 12in/35 guns' rammers were outside the barbettes and could only be loaded directly ahead or abeam, resulting in a firing rate of just once per seven minutes. A gunnery officer's improvised telescoping rammer reduced this to once every two minutes by 1898. Secondary armament comprised four 6in/40-caliber BL guns in casemates and two additional 6in guns mounted on the main deck. Twelve 6-pdr guns were mounted in casemates while ten 1-pdrs, two Gatlings, and four searchlights were mounted topside. *Texas*' four 18in Whitehead torpedo tubes were removed by 1904.

Texas was fitted with a 12in thick, 118ft Harvey armor belt along the waterline. *Texas*' most distinctive feature was her lozenge-shaped, 12in thick "armored redoubt" surrounding both 12in/35-caliber barbettes and superstructure. Twelve inches of side armor and a 1in armor roof protected the 12in/35 turrets. A 2–3in protective deck provided horizontal protection. Nine inches of armor shielded *Texas*' conning tower.

Texas' machinery was constructed by the Richmond Locomotive & Machinery Works in Richmond, Virginia. Four double-ended fire-tube boilers provided 150psi steam to two three-cylinder VTE engines, rated 8,610ihp. Propulsion was arranged in two boiler and two engine rooms, with 850-ton capacity coal bunkers outboard. Two Edison dynamos generated electric power.

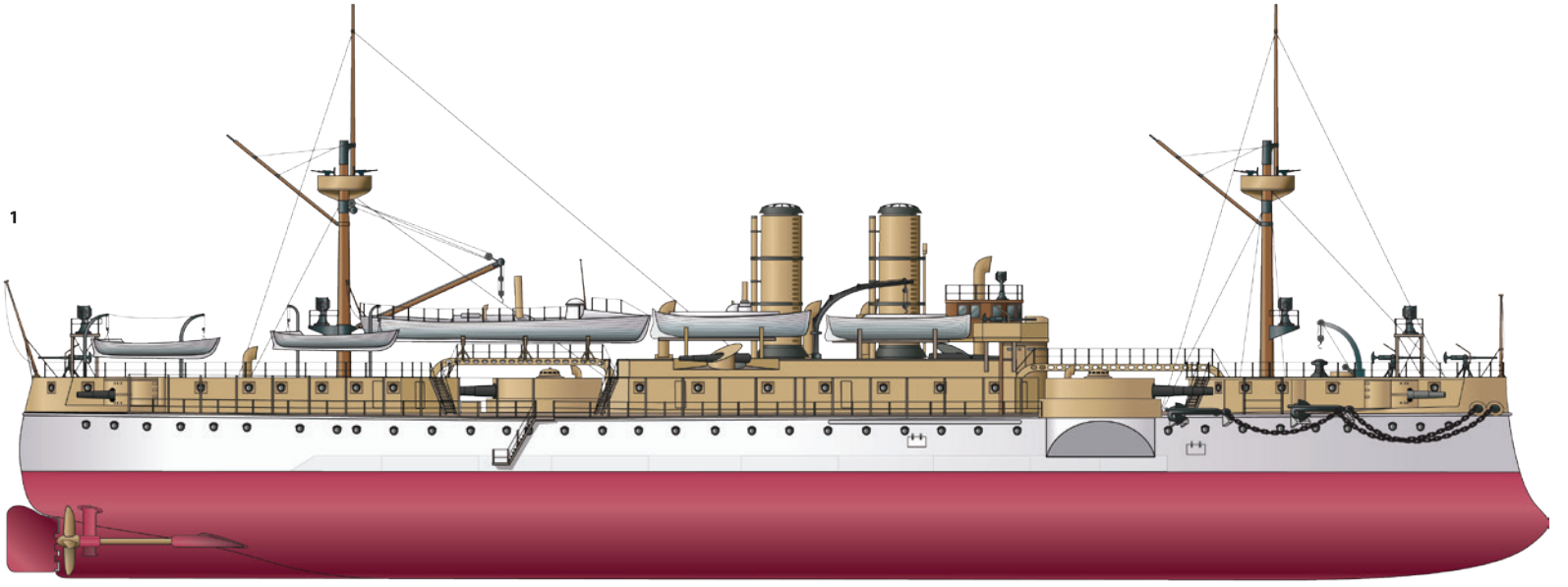
C

SECOND-CLASS BATTLESHIPS

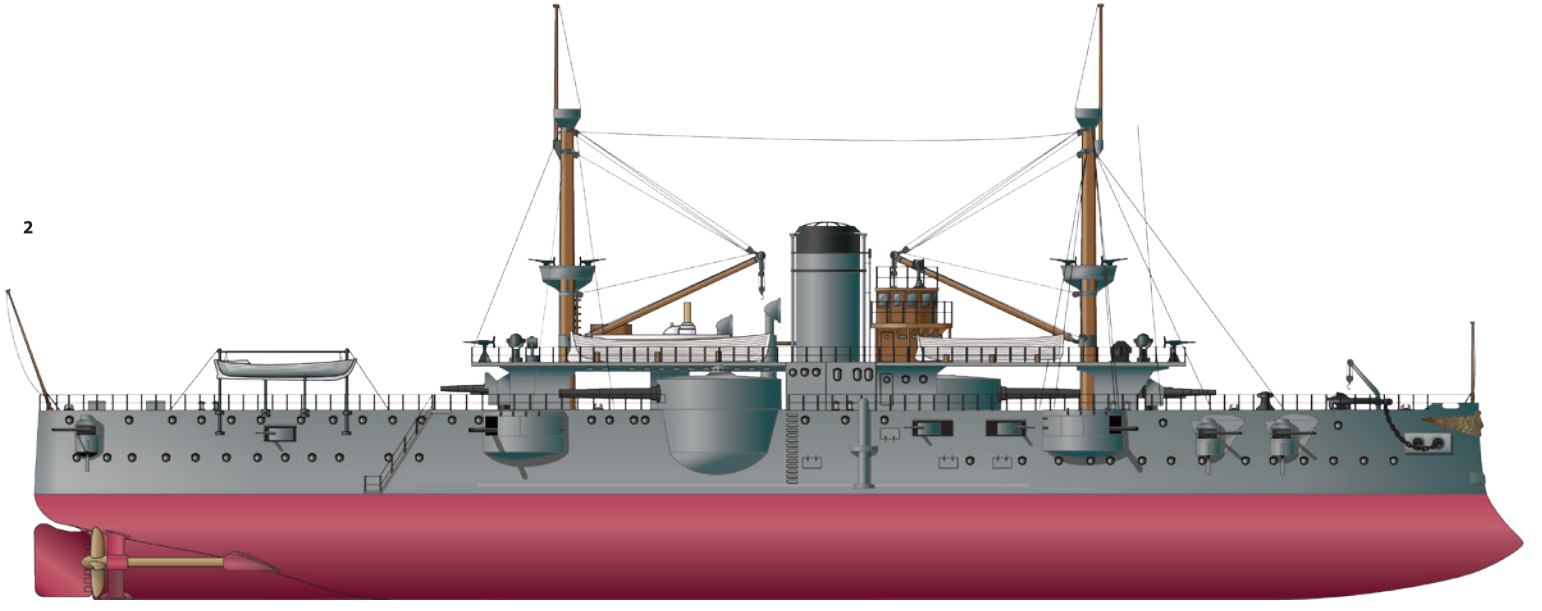
1: *Maine* is seen in peacetime white and ocher in 1898. With a length of 318ft and beam of 57ft, she possessed a cruiser-like 5.59:1 length-to-beam ratio. The development of high-explosive medium-caliber shells during *Maine*'s construction necessitated a late main battery design change from lightweight barbettes to heavier armored turrets. *Maine*'s heavier-than-planned 10in/35-caliber main battery required mounting a deck lower than planned, making *Maine* fairly wet. The poorly balanced hull made her lively in heavy seas, while her lower freeboard also contributed to *Maine*'s comparatively inferior sea-keeping.

2: *Texas* is seen in 1898 in wartime haze gray. *Texas* was 301ft long with a beam of 64ft, giving her a 4.65:1 length-to-beam ratio. Despite *Maine*'s finer plan and more powerful machinery (9,293ihp to 8,610ihp), a better-designed form made *Texas* slightly faster at 17.8 knots to *Maine*'s 16.5 knots. *Texas* was additionally the better-balanced ship as her heavy 12in/35-caliber main battery was mounted higher and farther amidships.

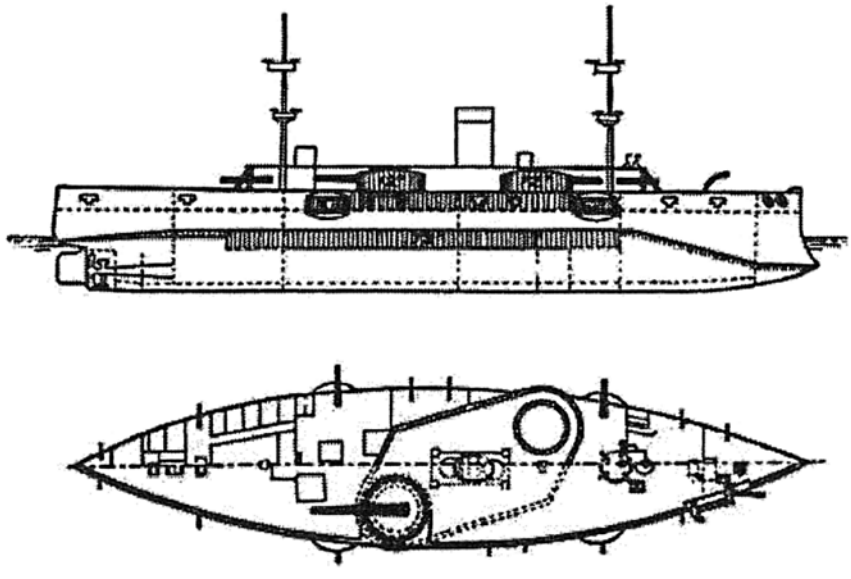
1



2



Texas' staggered 12in guns theoretically allowed the full battery to fire in any direction. Surrounding the two 12in turrets is the lozenge-shaped armor redoubt. *Texas*' belt and reinforced bow ram are also apparent. (Author's collection)



Texas-class Construction						
Ship	**Built at**	**Yard**	**Laid down**	**Launched**	**Commissioned**	**Fate**
Texas	Portsmouth, VA	Norfolk NY	Jun 1, 1889	Jun 28, 1892	Aug 15, 1895	Sunk as gunnery target Mar 22, 1912

USS *Texas* specifications	
Length:	301ft, 4in
Beam:	64ft, 1in
Draft:	22ft, 6in
Displacement:	6,315 tons
Propulsion:	Two VTE engines, four double-ended fire-tube boilers
Speed:	17.8 knots at 8,610ihp
Range:	Radius 2,900nm at 10 knots
Coal capacity:	850 tons
Armament:	Two 12in/35-caliber BL rifles in two single turrets (160 rounds)
	Six 6in/40-caliber BL rifles (600 rounds)
	Twelve 6-pdrs, ten 1-pdrs, two .45–70 Gatlings
	Four above-water 18in Whitehead torpedo tubes (eight torpedoes)
Protection:	Belt: 6–12in (Harvey)
	Redoubt: 12in
	Conning tower: 9in
	Deck: 2–3in
Complement:	30 officers, 362 enlisted
Cost:	$4.2 million

FIRST-CLASS BATTLESHIPS 1889–97

When Secretary Benjamin Tracy's six-member Naval Policy Board convened in July 1889, the US Navy ranked 12th largest in the world behind China and Chile. Nevertheless, the Board brazenly envisioned an extravagant

12-year, $349.5 million construction program of 237 warships, including a long-ranged strike fleet of ten 17-knot, 10,800nm first-class battleships backed by twenty-five additional 15-knot, 4,600nm second-class battleships to defend the East and West Coasts. The plan, prematurely leaked, outraged even the pro-Navy Republican Congress. On June 30, 1890, Congress authorized a mere three "sea-going coast-line battleships" carrying "the heaviest ordnance upon a displacement of about 8,500 tons," while requiring one be built on the West Coast.

A view of battleship USS *Indiana*'s portside bow, giving an excellent view of the Indiana-class' bridge, foremast, forward 13in and 8in guns, and refit-lengthened stacks. In calm seas the powerful Indianas might have accounted themselves well against larger European battleships. (NHHC NH 73975)

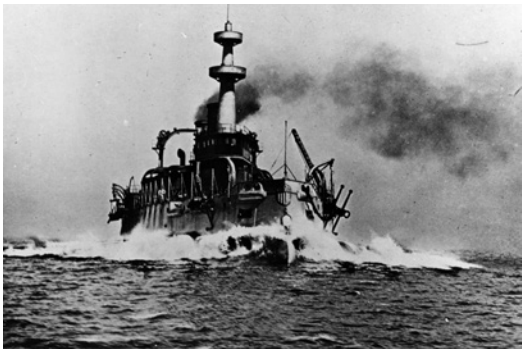
The USN adopted a modern centerline arrangement for its "1st class Battle Ship(s) of Limited Coal Endurance," the Indiana-class. They were the first US battleships assigned hull numbers (Battleships Nos 1–3) and resembled the 1889 slow, short-range battleship concept. No battleships were approved by the newly elected Democratic House of Representatives in 1891, but in July 1892, the House agreed to the singular 9,000-ton "Sea Going Battle Ship No. 1." Eventually renumbered Battleship No. 4, *Iowa*'s original designation reveals an explicitly new mission. Designed for 17 knots, longer range, and improved sea-keeping features, *Iowa* somewhat recalled the 1889 offensive battleship concept.

Indiana class (1895–96)

Tracy ordered the Bureau of Construction & Repair's Lieutenant Lewis Nixon to draw up a basic design on 8,000 tons, then ordered two revisions until Nixon produced a sketch for a 10,300-ton battleship with a heavier full battery discharge (6,800lb to 6,000lb) than the 14,150-ton British Royal Sovereign-class battleships; not until 1910 would the dreadnought *Michigan* (BB-27) finally exceed the Indianas' broadside. In 1891, *Indiana* (BB-1) and *Massachusetts* (BB-2) were assigned to Philadelphia's William Cramp & Sons, while *Oregon* (BB-3) went to San Francisco's Union Iron Works. They were commissioned between November 1895 and July 1896. The Indianas were 348ft long and displaced 10,288 tons. Design speed was 15 knots, with a range of 3,720nm at 10 knots.

Bluejackets and marines of *Iowa* pose in front of the battleship's forward 12in/35-caliber guns in August 1898. Behind them, *Iowa*'s bridge is displayed prominently. Eight-inch intermediate guns are visible to the right of the 12in turret. (NHHC NH 87)

The Indianas were armed with four 13in/35-caliber guns in two centerline turrets, firing 1,130lb AP shells. Heavily flawed by design compromises, the 489-ton pillbox-style Mark 2 turrets were unbalanced, with their centers of weight 4ft in front of their rotational axis. Lacking a sufficiently sized RF battery, the Indianas mounted a contrived "intermediate" battery of eight slow-firing 8in/35-caliber guns in four wing turrets; the cramped placement of the 8in/35s and 13in/35s caused severe muzzle blast interference. Four 6in/40-caliber BL guns provided the secondary battery. Twenty



ABOVE LEFT
Battleship USS *Indiana* seen in profile in the early 1900s; *Indiana*'s stacks have been lengthened from their original 40ft height. The Indianas' contorted "sea-going coastline battleship" designation was the sly committee suggestion of pro-Navy Republican congressman Henry Cabot Lodge. (LOC)

ABOVE RIGHT
Oregon is seen in May 1896 running builder's trials off Santa Barbara, California. Her 13in/35-caliber main battery remains uninstalled. Nicknamed "Bulldog of the Navy," *Oregon* proved the fastest Indiana at 17 knots and was the first US battleship built on the West Coast. (NHHC NH 75019)

6-pdrs were mounted topside, with six 1-pdrs mounted in casemates and the foremast's fighting top. Four above-water 18in Whitehead torpedo tubes were mounted abeam.

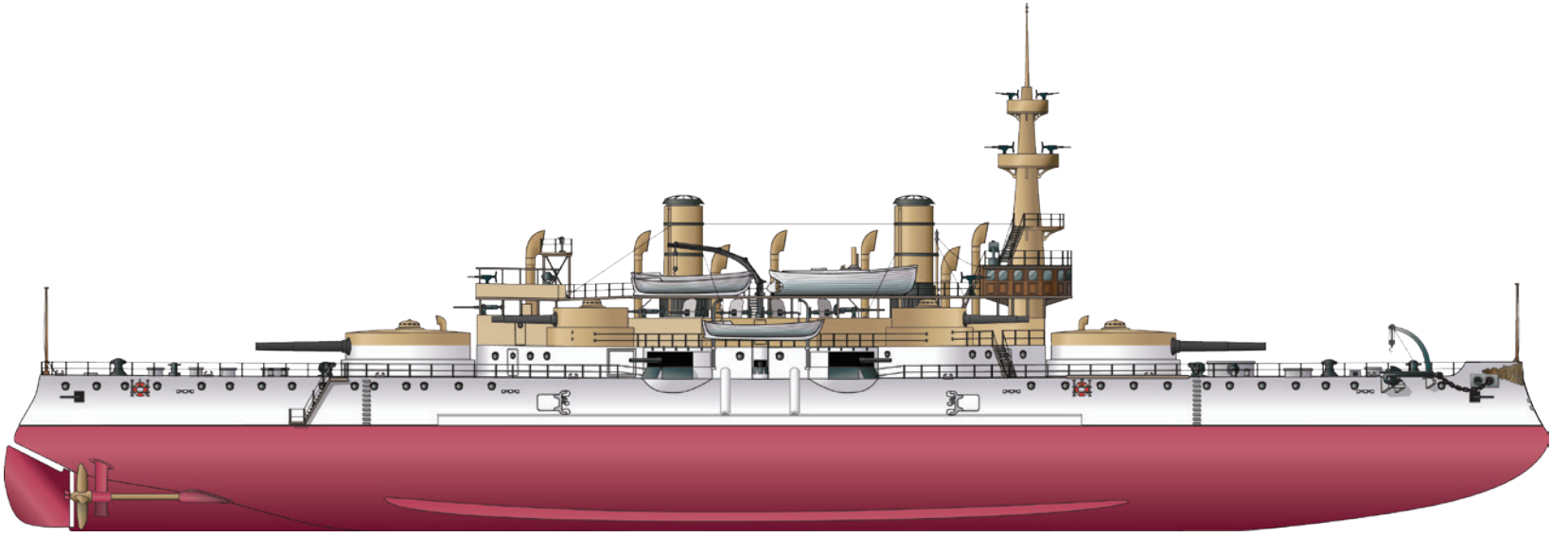
An 18in Carnegie-forged Harvey belt extended two-thirds of the waterline. However, the unbalanced 13in turrets produced a five-degree list when trained abeam, submerging the near belt and lifting the opposite belt clear of the water. The belt was additionally designed for a 400-ton coal load; with the usual full load of 1,600 tons it was completely submerged. Thinner armor extended upwards from the main belt and armored transverse bulkheads, with a nickel-steel armored deck enclosing the armored citadel from above and a double bottom from below. Fifteen inches of armor shielded the 13in turrets and barbettes, with 6–8in nickel-steel protecting the 8in turrets and barbettes.

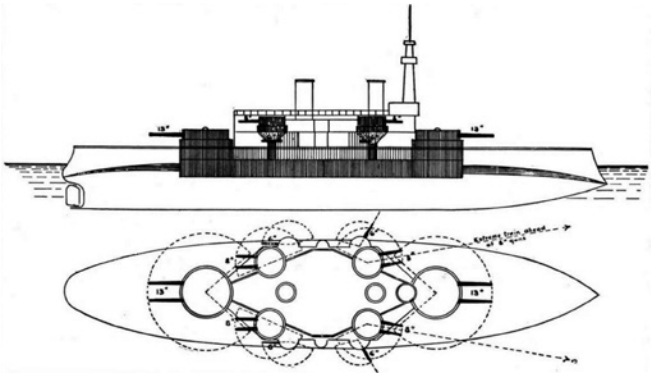
Four double-ended fire-tube boilers in forced-draft fire rooms provided 160psi steam to two inverted VTE engines, producing 9,738ihp. Two single-ended boilers and three 24-kilowatt dynamos powered auxiliaries such as interior lighting, searchlights, electric fans, and control indicators. Eventually electric rammers and motors replaced the hydraulic turret systems. Electric shell hoists lifted 8in and smaller ammunition two decks upwards to a shell trolley; the shells were then transported forward or aft to the appropriate gun via an overhead monorail.

The Indianas are often considered the first true US battleships despite being small, slow, and short-ranged by international standards. Weapons, machinery, and accommodations were cramped. Only nine line officers were assigned to the undersized crews. A mere 12ft freeboard ensured the battleships were awash in modest seas, affecting the 13in batteries and 6in casemates. Bilge keels were deleted during construction to fit existing American drydocks. The class consequently rolled heavily. In an October 1896 storm, *Indiana*'s unbalanced 13in turrets broke loose from their clamps and began swinging freely. It took several hours to successfully secure them. The installation of

D

BATTLESHIP USS *INDIANA* (BB-1)
Battleship USS *Indiana* is seen in 1896, shortly after commissioning. She is wearing white and buff peacetime livery while sporting black gun barrels. The view reveals the tight placement of the 8in/35-caliber wing turrets amidships the 13in/35-caliber main battery. The Indiana-class battleships were built to William Cramp & Sons' modified plan, which was 10ft longer than the original USN design. Although superficially almost identical, the three Indianas were conspicuously diverse in internal details and at-sea performance, particularly *Oregon*, built by Union Iron Works in San Francisco.





Indiana was designed for an 18in, two-thirds waterline nickel-steel armor belt. The unexpected late availability of Harvey armor allowed an extraordinarily robust 18in Harvey belt to be fitted instead. *Indiana*'s armored deck and lighter intermediate battery protection can also be seen. (Scientific American/Public domain)

bilge keels and stronger clamps prevented a recurrence. Despite their flaws, the Indianas' firepower and protection were formidable. Considering their impressive wartime performance, the Indiana-class must be considered a success.

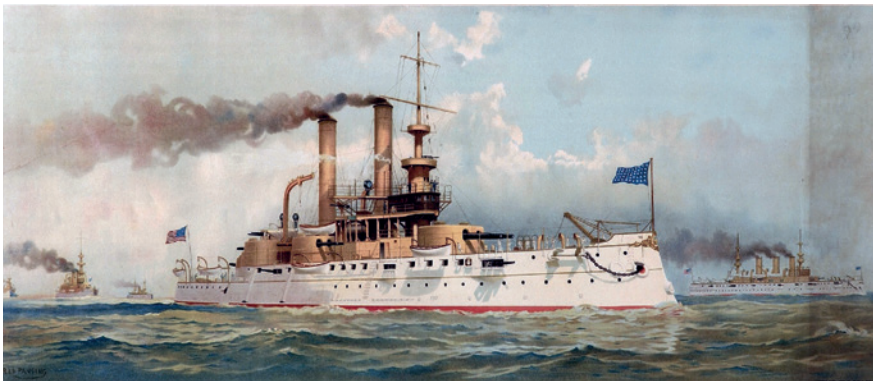
In 1901, each 13in turret was laden with 28 tons of lead ballast to improve balance. A Chilean offer to buy all three Indianas was concurrently rejected. Torpedo tubes and most smaller guns were removed in 1908 and funnels lengthened to improve propulsion. A standardized anti-torpedo battery of 12 3in/50-caliber guns was added in 1909–10 along with a cage mainmast.

Indiana-class Construction

Ship	Built at	Yard	Laid down	Launched	Commissioned	Fate
Indiana (BB-1)	Philadelphia, PA	Cramp & Sons	May 7, 1891	Feb 28, 1893	Nov 20, 1895	Sunk as bombing target Nov 1, 1920
Massachusetts (BB-2)	Philadelphia, PA	Cramp & Sons	Jun 25, 1891	Jun 10, 1893	Jun 10, 1896	Scuttled Jan 6, 1921
Oregon (BB-3)	San Francisco, CA	Union Iron Works	Nov 19, 1891	Oct 26, 1893	Jul 15, 1896	Scrapped 1956

Indiana-class specifications

Length:	348ft
Beam:	69ft, 3in
Draft:	24ft
Displacement:	10,288 tons
Propulsion:	Two VTE engines, four double-ended fire-tube boilers
Speed:	(*Indiana*) 15.55 knots at 9,738ihp
	(*Massachusetts*) 16.2 knots at 10,400ihp
	(*Oregon*) 16.8 knots at 11,000ihp
Range:	(*Indiana*) Radius 3,720nm at 10 knots
	(*Massachusetts*) 4,500nm
	(*Oregon*) 5,500nm
Coal capacity:	1,597 tons
Armament:	Four 13in/35-caliber BL rifles in two double turrets (240 rounds)
	Eight 8in/35-caliber BL rifles in four wing turrets (600 rounds)
	Four 6in/40-caliber BL rifles (400 rounds)
	Twenty 6-pdrs, six 1-pdrs, four .45–70 Gatlings
	Four above-surface 18in Whitehead torpedo tubes (six torpedoes)
Protection:	(Harvey) Belt: 18in
	Sides: 5in
	Deck: 3in nickel-steel
	Conning tower: 10in nickel-steel
	Main turrets 15in, barbettes 17in
Complement:	32 officers, 441 enlisted
Cost:	$5.9 million



Iowa's raised forecastle and forward 12in turret were both one deck higher than *Indiana*'s, well-illustrated in this Fred Pansing painting. To retain stability, each of *Iowa*'s 12in/35-caliber guns was 18 tons lighter than their 13in/35 *Indiana* counterparts, a design choice retained from the unrealized 1889 long-ranged battleship concept. (Author's collection)

USS *Iowa* (1897)

Laid down at Philadelphia's William Cramp & Sons in August 1893, USS *Iowa* (Battleship No. 4, or BB-4) was commissioned in June 1897. *Iowa*'s design was essentially an improved Indiana-class vessel, addressing her predecessors' most glaring deficiencies through weight-balanced main battery turrets, greatly reduced, fireproofed wood furnishings, and a raised forecastle extending two-thirds of the ship for much-improved seakeeping. *Iowa* additionally employed a tumblehome hull, unique for US battleships. At 11,340 tons, *Iowa*'s increased size and freeboard allowed higher speed, longer range, a less-cramped layout, and better accommodations for a larger crew. A 14in Harvey main belt protected three-quarters of *Iowa*'s waterline.

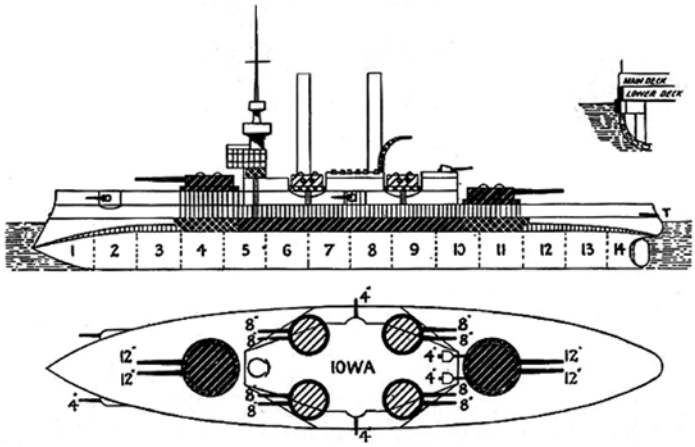
Iowa mounted four 12in/35-caliber BL guns in two Mark 3 turrets. Firing 870lb shells, the 12in/35 guns were considered sufficiently powerful against enemy battleships but saved 72 tons over the Indianas' 13in/35-caliber guns. *Iowa*'s Turret I was mounted one deck (7ft, 9.5in) higher than *Indiana*'s to clear her forecastle, while her eight 8in/35-caliber guns were positioned farther amidships than *Indiana*'s to address muzzle blast interference. Six casemated 4in/40-caliber RF guns replaced *Indiana*'s 6in/40-caliber secondary battery. Twenty 6-pdrs, four 1-pdrs, and four M1895 machine guns were additionally mounted. *Iowa* employed four above-water beam 14in Howell torpedo tubes.

Three double-ended and two single-ended fire-tube boilers provided 160psi steam to two VTE engines, producing 12,105ihp. *Iowa* repeated *Indiana*'s forced fire room draft and mechanical ash hoists. Induced draft from taller, 100ft funnels helped provide *Iowa*'s engines with more efficient power.

Iowa was clearly the finest early US battleship. The 1896 Walker policy board studying Illinois-class designs recommended that future battleships be "substantially like the *Iowa*." By 1903, the recently established General Board recommended high freeboard for the Connecticut-class, noting, "In this respect the *Iowa* type impresses favorably." The USN had managed to anticipate the failings of *Iowa*'s predecessors and largely correct them by *Iowa*, despite her being laid down two years before any US battleships entered service.

A fine view of battleship USS *Iowa*, seen underway in peacetime white and ocher livery. *Iowa*'s distinctive long, high forecastle, tall funnels, and tumblehome hull are readily apparent. Midshipman Raymond A. Spruance served aboard *Iowa* in 1906–07. (US Navy)

Lighter Harvey armor allowed *Iowa* to incorporate a 14in Harvey belt, equal in strength to the 18in nickel-steel belt originally planned for the Indianas. The weight saving was used to extend the belt to three-quarters of *Iowa*'s waterline. Otherwise *Iowa*'s armor plan generally followed the Indianas. (Public domain/ Wikimedia Commons)



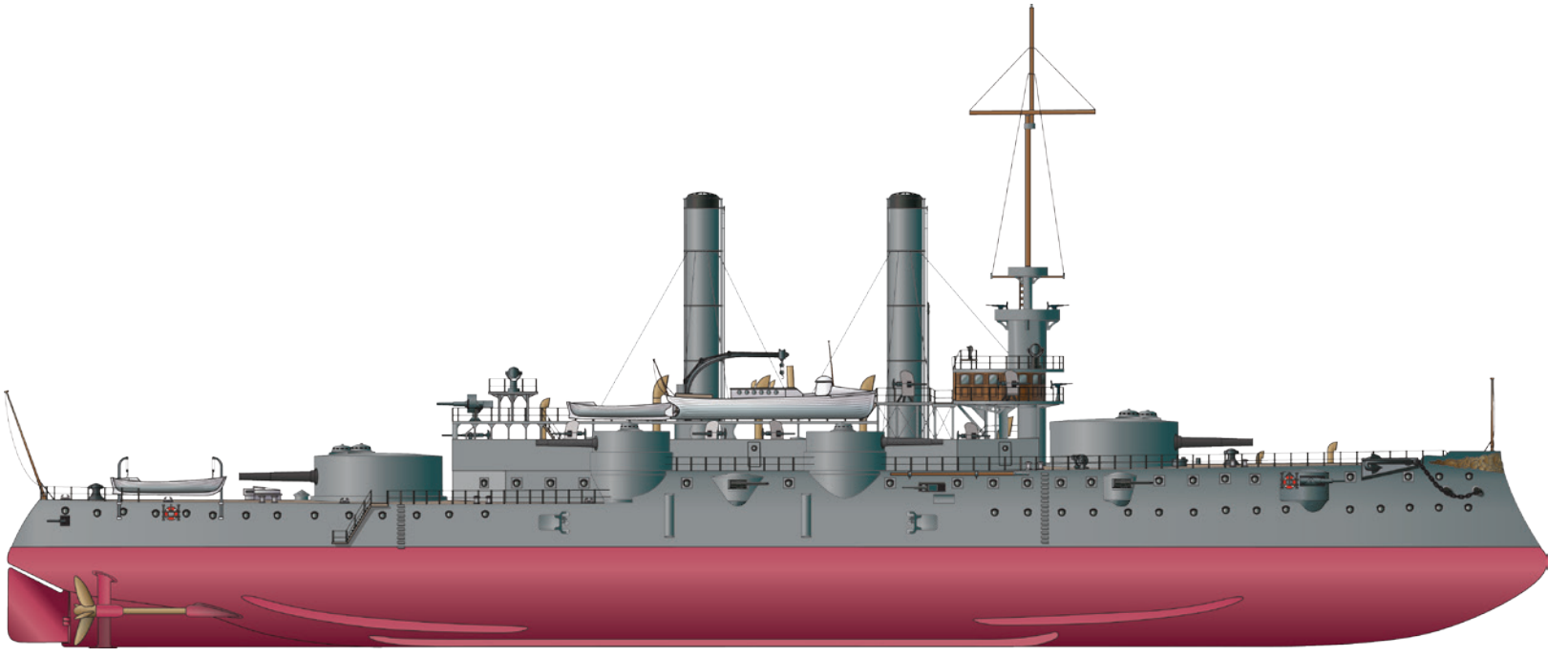
Iowa-class Construction						
Ship	**Built at**	**Yard**	**Laid down**	**Launched**	**Commissioned**	**Fate**
Iowa (BB-4)	Philadelphia, PA	Cramp & Sons	Aug 5, 1893	Mar 28, 1896	Jun 16, 1897	Sunk as gunnery target Mar 23, 1923

USS *Iowa* (BB-4) specifications	
Length:	360ft
Beam:	72ft, 2.5in
Draft:	24ft
Displacement:	11,340 tons
Propulsion:	Two VTEs, five boilers
Speed:	17.09 knots at 12,105ihp
Range:	Radius 4,500nm at 10 knots
Coal capacity:	1,795 tons
Armament:	Four 12in/35-caliber BL rifles in two double turrets (240 rounds)
	Eight 8in/35-caliber BL rifles in four wing turrets (600 rounds)
	Six 4in/40-caliber RF guns
	Twenty 6-pdrs, four 1-pdrs, four Colt-Browning M1895 .30-40 machine guns
	Four above-water 14in Howell torpedo tubes (eight torpedoes)
Protection:	7–14in Harvey belt
	Sides: 5in
	Deck: 3in
	Conning tower: 10in
	Main turrets 17in, barbettes 15in
Complement:	36 officers, 469 enlisted
Cost:	$5.87 million

E

BATTLESHIP USS *IOWA* (BB-4)

USS *Iowa* was arguably the Steel Navy's first capital ship that wasn't obsolescent or seriously flawed upon commissioning. She is seen in summer 1898, painted in wartime haze gray for Spanish-American War combat. The view reveals her distinctively tall funnels and her raised forecastle extending two-thirds of *Iowa*'s length. The raised forecastle places her forward main battery turret at the same level as her 8in/35-caliber wing turrets and one deck higher than on the Indiana-class.



OPERATIONAL HISTORY

The *Maine* disaster, February 15, 1898

In January 1898, Captain Charles Dwight Sigsbee's battleship *Maine* was dispatched to Havana, Cuba, to show the flag and support American interests during the tense Cuban War of Independence. At 2140hrs on February 15, while anchored in Havana Harbor, *Maine* was torn apart by a massive explosion that destroyed the forward part of the ship. Later analysis revealed five tons of powder from the forward 6in and 10in magazines had detonated. A cadet recalled a gunshot-like sound followed by *Maine*'s lights going out, and then an "indescribable roar, a terrific crash, intense darkness." Lieutenant John Blandin described "a dull, sullen roar. Would to God that I could blot out the sound and the scenes that followed … a perfect rain of missiles of all descriptions, from huge pieces of cement to blocks of wood, steel railings, fragments of gratings, and all the debris that would be detachable in an explosion."

Captain Sigsbee recalled:

> A bursting, rending, and crashing sound or roar of immense volume, largely metallic in character. It was followed by a succession of heavy, ominous, metallic sounds, probably caused by the overturning of the central superstructure and by falling debris. There was a trembling and lurching motion of the vessel, a list to port, and a movement of subsidence. The electric lights went out. Then there was intense blackness and smoke… None can ever know the awful scenes of consternation, despair, and suffering down in the forward compartments of the stricken ship; of men wounded, or drowning in the swirl of water, or confined in a closed compartment gradually filling with water.

Officers reported the blazing bow was beyond saving. Fearing further detonations, Captain Sigsbee gave the order to abandon ship. By then *Maine*'s deck was even with the water. Launches from Spanish cruiser *Alfonso XII* and nearby merchantmen pulled survivors out of the harbor. The mysterious explosion ultimately killed 261 of *Maine*'s 355 men. Just 16 of the 94 survivors escaped unharmed. Only three officers died, the result of being berthed in the after part of the ship.

The USN's official court of inquiry, chaired by Captain William T. Sampson, found on March 21 that the explosion had been the result of a naval mine.

BELOW LEFT
Second-class battleship USS *Maine* seen fatefully entering Havana harbor on January 25, 1898. She would never leave, being destroyed by a mysterious explosion on February 15. Looming above *Maine* to the right is Havana's Morro Castle, built in 1589. (US Navy)

BELOW RIGHT
The shattered wreck of battleship *Maine*, seen on February 16, 1898, the morning after her portentous explosion. Utterly demolished, she has settled onto the harbor floor. She would sink several feet deeper into the Havana harbor mud in the coming weeks. (NHHC NH 46776)

The primary corroborating evidence was the inward crumpling of *Maine*'s keel at frame 18 (thrust upwards some 30ft), extensive testimony reporting unsuspicious coal bunkers shortly beforehand, and many reports claiming a double detonation both seen and heard. The Sampson board declined to suggest what "person or persons" might be responsible for an attack.

Between December 1910 and November 1911, US Army engineers built a cofferdam around *Maine* and pumped the wreckage dry. American bodies were removed and reinterred at Arlington National Cemetery, and a new inquiry under Rear Admiral Charles E. Vreeland inspected the wreck. They found inconsistencies with the Sampson Board but also concluded an external explosion caused *Maine*'s destruction. *Maine*'s stern was then refloated on February 13, 1912, towed to the Florida Straits, and scuttled three miles northeast of Havana in 3,770ft of water on March 16.

In 1974, famed USN engineer Admiral Hyman Rickover sponsored a private investigation of the *Maine* disaster. Rickover concluded *Maine* was not destroyed by a mine and speculated a spontaneous coal bunker explosion detonated the forward magazines. Smoldering coal bunkers were a common, well-known occurrence in period steamships. Intriguingly, a January 27, 1898, USN report had warned that catastrophic magazine detonation by recent coal bunker fires in cruisers *Cincinnati* and *New York* had only narrowly been averted – this just weeks before *Maine*'s destruction. *Maine* had been using bituminous coal, notorious for emanating highly explosive firedamp (inflammable gas). The most accepted theory by modern historians is that a smoldering coal bunker detonated *Maine*'s adjacent bow magazine.

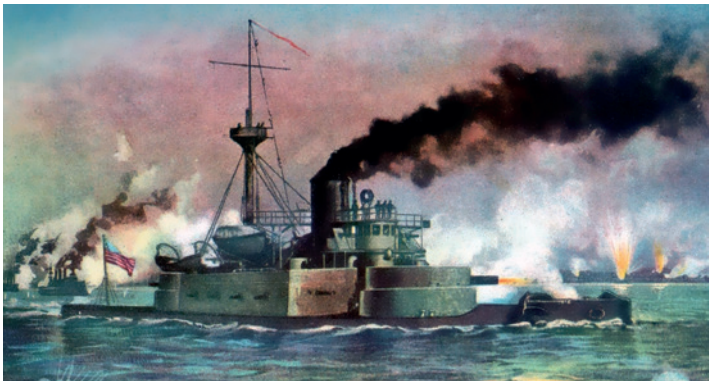
The Spanish-American War, April–August 1898

The full causes and consequences of the 1898 Spanish-American War are beyond the scope of this study. However, the destruction of the *Maine* was among the last in a sequence of Spanish-American tensions over Cuba that had been building towards war for decades. Despite expressed Spanish sympathy, already strained Spanish-American relations deteriorated rapidly. "Remember the *Maine*! To hell with Spain!" became the American rallying cry. American demands became increasingly unrealistic, and by the time Spain and the United States mutually declared war on April 25, the official declarations were almost an afterthought.

The USN war plan largely followed Lieutenant William Kimball's 1896 NWC blueprint *War with Spain*. Newly promoted Rear Admiral William T. Sampson commanded the North Atlantic Squadron, which would execute a blockade of Cuba from Key West, Florida. Public clamor over seemingly undefended cities compelled the USN to compromise its single battleship fleet, forming a Hampton Roads-based Flying Squadron under Commodore Winfield Scott Schley to defend the East Coast.

Earlier, Captain Charles Clark's West Coast-based *Oregon* had been ordered to Callao, Peru, departing San Francisco on March 19. On April 6, *Oregon* coaled at Callao, received orders to head for Florida,

Oregon plows through 1898 seas, likely during her odyssey around South America. Captain Clark successfully convinced his crew to curtail their water rations and only drink what had already passed through the boilers, preserving the freshest distilled water for *Oregon*'s powerplant. (NHHC NH 63647)



Monitor *Puritan* depicted shelling Matanzas, Cuba, on April 27, 1898, in a Murat Halstead painting from the same year. *Puritan* was accompanied by cruisers *New York* and *Cincinnati*. The USN employed the monitors offensively, with considerable boldness. (Murat Halstead/ Public domain)

and entered the Strait of Magellan in stormy seas late on April 16. After anchoring in deep water overnight, *Oregon* coaled at Punta Arenas, Chile, before arriving at Rio de Janeiro on April 30. Coal was again taken aboard and it was discovered war had been declared. *Oregon* reached Bahia, Brazil, on May 8, her crew aware a Spanish squadron loomed at large in the Atlantic. After a May 18 coaling in Bridgetown, Barbados, *Oregon* arrived at Jupiter Inlet, Florida, on May 24, having steamed a total of 13,675nm in 66 days. *Oregon* had averaged 11.6 knots, consuming 4,100 tons of coal. Not an hour had been wasted having to stop and repair engines. The battleship's odyssey occurred in an era of primitive, unreliable steamship machinery, and her astonishing engineering and seamanship feat made world headlines. Late on May 26, Captain Clark read a telegram to his crew from Secretary of the Navy John D. Long: "The department congratulates you, your officers and crew, upon the completion of your long and successful voyage."

On April 21, Sampson's North Atlantic Squadron had left Key West to blockade Cuba. Four days later, *Indiana* sortied from the Dry Tortugas to blockade Havana, capturing Spanish merchantman *Panama* en route. On April 27, *Puritan* and cruisers *New York* and *Cincinnati* bombarded nearby Matanzas Bay; *Puritan* and her monitor half-sisters *Amphitrite*, *Terror*, and *Miantonomoh* would conduct bombardments and armed landings at various Cuban and Puerto Rican ports through August.

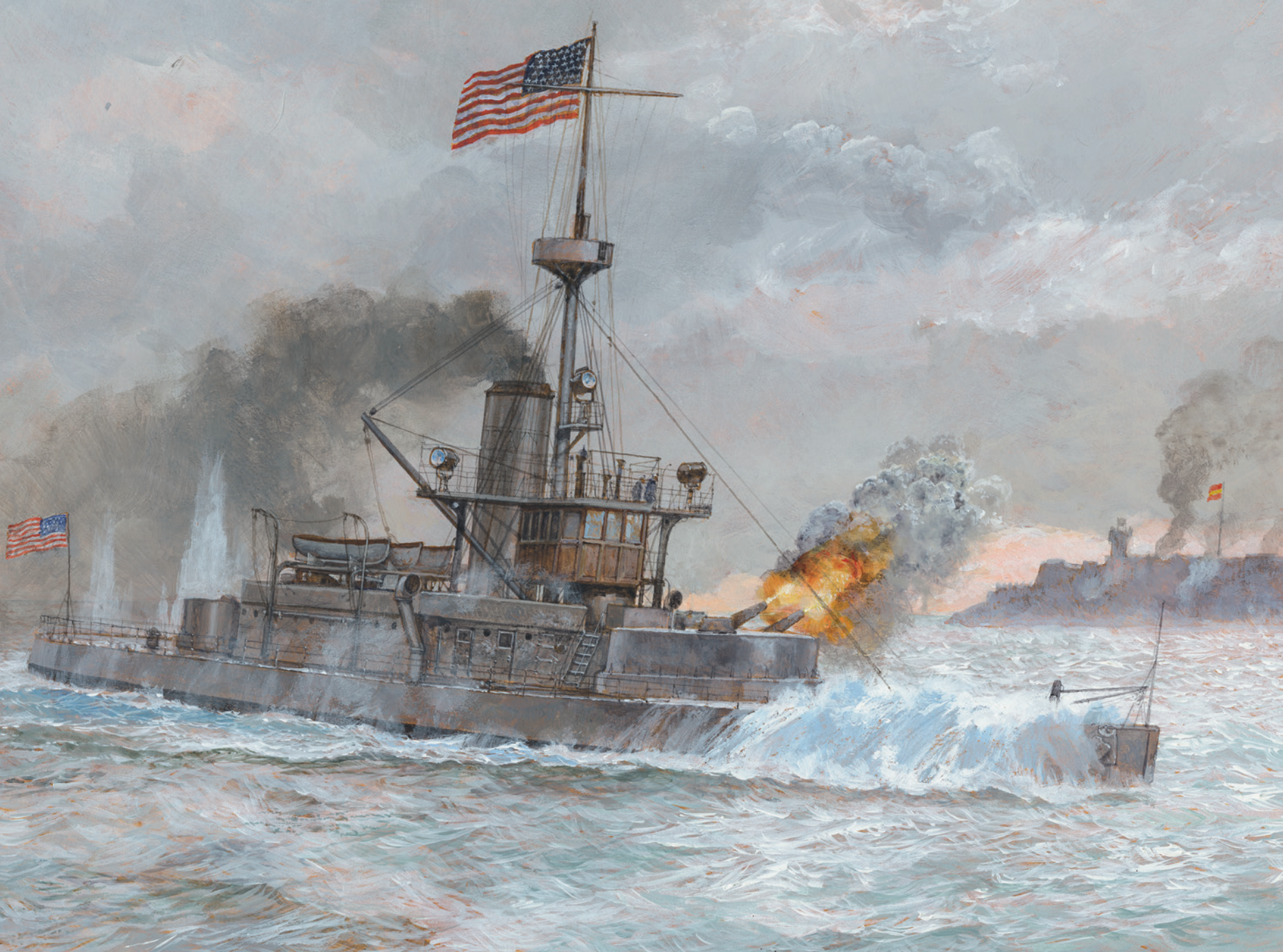
On April 29, Spain's Armada Española responded, ordering a flotilla under Contraalmirante Pascual Cervera y Topete to depart the Cape Verde Islands for the Caribbean. Cervera's dilapidated squadron comprised cruisers *Infanta Maria Teresa*, *Cristóbal Colón*, *Vizcaya*, and *Almirante Oquendo*, and destroyers *Furor*, *Pluton*, and *Terror*. Cervera's cruisers were each of 7,000 tons, a nominal 20 knots, and armed with two 11in or 10in guns and a 5.5in secondary battery. However, all were in a state of total disrepair. Additionally, Cervera utterly lacked material support or strategic guidance from his fatalist government. When ordered to sortie, Cervera responded, "Disaster is upon us."

Hoping to intercept Cervera, Sampson's North Atlantic squadron sortied from Key West on May 3 and rendezvoused with monitors *Terror* and

F

MONITOR USS *TERROR* BOMBARDS SAN JUAN, PUERTO RICO, WITH SAMPSON'S NORTH ATLANTIC SQUADRON, MAY 12, 1898

Sampson's North Atlantic Squadron arrived off San Juan, Puerto Rico, the morning of May 12, 1898, and opened fire at 0516hrs. Captain Nicoll Ludlow's monitor USS *Terror* (BM-4) is seen close to shore, shelling the San Juan fortification of Castillo San Felipe del Morro and coming under return fire from Spanish coastal artillery. Wind and seas were high, causing ships to roll and hurting US gunnery. Dense white smoke so obscured targeting that Sampson eventually ordered "use large guns only." *Terror*, fifth in the US column, unleashed 31 10in/30-caliber rounds in three passes, including one that scored a "most vicious" direct hit on a Spanish artillery battery. *Terror* retired at 0815hrs, having suffered no casualties. Sampson's squadron had lost a total of two killed and three wounded. Spanish casualties came to seven killed and 52 wounded, including civilians.



Amphitrite, which had departed Key West two days earlier. To conserve coal, *New York* took *Terror* under tow, while *Iowa* took on *Amphitrite*. *Iowa* Captain Robley "Fighting Bob" Evans recalled:

> When we reached the rendezvous, late in the evening, we found there, among other ships, two monitors – the *Terror* and the *Amphitrite*… I was directed to tow the *Amphitrite* with the *Iowa*. The sea was very smooth, and we were soon pulling her along at nine knots, but before the job was finished I wished I had never seen a monitor. When once out from the protection of the shoals the sea began to rise, and soon everything in the way of towlines had been parted, and it was only when we slowed down to seven knots or less that we could make anything hold. We found ourselves in the open sea looking for an enemy who could steam at the speed of sixteen to eighteen knots while we could barely maintain seven. The prospect of catching him was not very bright. However, we were doing our best with the tools the Government had given us.

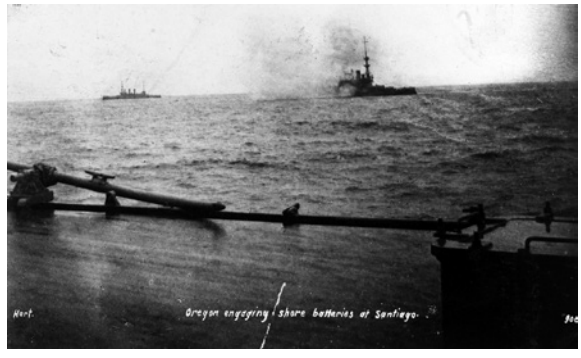
On May 12, Sampson's North Atlantic Squadron of *Iowa*, *Indiana*, *Amphitrite*, *Terror*, *New York*, and torpedo boat *Porter* arrived off San Juan, Puerto Rico, in search of the absent Cervera. *Iowa* opened fire at 0516hrs, initiating two-and-a-half hours of US bombardment, to which Spanish artillery retaliated in kind. After three shelling passes, Sampson's fleet retired towards Key West.

Cervera arrived at Santiago de Cuba on May 19, minus destroyer *Terror* which had detached to San Juan. After much confusion, Schley's Flying Squadron confirmed Cervera's location on May 29. Two days later, *Iowa*, *Massachusetts*, and cruiser *New Orleans* half-heartedly shelled Santiago from 7,000 yards, provoking two hours of Spanish counter-battery fire. Sampson arrived with *Oregon*, *New York*, armed yacht *Mayflower*, and torpedo boat *Porter* on June 1, taking command of the combined force. Sampson hoped to bottle up Cervera by sinking collier *Merrimac* in the Santiago channel. Reportedly every member of *Iowa*'s crew volunteered for the dangerous mission; *Iowa*'s winner was coxswain J.C. Murphy, who refused $50 to surrender his place. Late on the night of June 3, Lieutenant J.G. Hobson's seven men began sneaking *Merrimac* into Santiago's harbor. Spanish artillery erupted, cutting *Merrimac*'s steering along with the electrical wiring to the charges. The current dragged the blazing, uncontrollable *Merrimac* out of the main channel and the raiders abandoned their sinking ship. Ironically, it was Cervera's launch that discovered Hobson's party. "*¡Valiente!*" (Courageous!) exclaimed Cervera as his Spaniards pulled the Americans out of the water. Under a flag of truce, Cervera sent word to Sampson that all seven Americans were unharmed.

By June 6, Sampson suspected the Spanish were attempting to remove *Merrimac* and ordered a bombardment of Santiago at 0740hrs. Spanish artillery returned fire. By the time the shelling ceased at 1000hrs, Santiago-based cruiser *Reina Mercedes* had taken 35 hits, killing her executive officer. Total casualties were nine Spaniards killed and 35 wounded, to none for the Americans.

Battleship *Indiana*, an Amphitrite-class monitor, and torpedo boat *Porter* are depicted shelling San Juan, Puerto Rico, on the morning of May 12, 1898. Sampson's bombardment was criticized as strategically worthless and unnecessarily hostile to a Puerto Rico the United States hoped to annex. (Photo by Buyenlarge/Getty Images)

During daylight, Sampson's Santiago blockade comprised an 8-mile arc of US warships 5–6 miles from the mouth of the harbor, the battleships in the center, cruisers and gunboats at the corners, and smaller ships inside the main arc, closer to the harbor mouth. The American ships all pointed their bows towards the harbor, "like a group of huge gray cats watching a mouse hole," according to one US sailor. At night, Sampson's fleet tightened its blockade arc to 3–4 miles. US battleships took turns directly illuminating Santiago harbor overnight with searchlights from a range of 1 mile. Smaller US warships' searchlights scanned the surrounding coastline. *Iowa*'s Captain Evans recalled, "The idea of deliberately placing a battleship within a mile or two of the fastest torpedo boats in the world, and then turning on a searchlight to mark her position, was novel in the least." However, the captain of destroyer *Pluton* claimed he scarcely slept in more than a month, having made nightly trips to the entrance in the hopes of finding an opening for the fleet to escape. But with the American battleships' searchlights beaming relentlessly on the harbor mouth, he had returned disappointed each time. According to Sampson's later report, "Many [Spaniards] freely expressed their opinion that it was impossible to pilot their ships out through the narrow channel with such a powerful light shining in the eyes of the officers."



Oregon seen engaging shore batteries at Santiago. Although this photo is sometimes captioned as occurring during the July 3 battle, the original caption does not mention the date and the scene could be any time from early June through to July 11, 1898. (US Navy)

To secure the blockade permanently, Sampson needed a sheltered harbor near Santiago to coal and repair his ships. On June 6, a marine detachment from *Oregon* and cruiser *Marblehead* landed at Guantánamo Bay. Four days later, the 1st Marine Battalion reinforced them from transport *Panther*. By June 16, the combined marine force had repulsed Spanish counterattacks and secured outer Guantánamo Bay, capped by a vicious 15-minute bombardment of the Cayo del Toro fortress by *Texas*, *Marblehead*, and auxiliary cruiser *Yankee*. Sampson began dispatching his battleships from the Santiago blockade every few days to replenish in Guantánamo's sheltered coves. A collier would tie alongside, her crew laboriously passing filthy coal sacks to the battleship as the rocking ships slammed into each other. The bags were then emptied one at a time into coal bunkers, being leveled and trimmed by hand below. After coaling from collier *Justin*, *Iowa*'s Captain Evans acknowledged, "Though we gave her some pretty hard knocks, no holes were punched in her side." By contrast, Evans disparaged collier *Sterling* "for having sides like paper." However, *Texas*' massive main battery sponsons prevented broadside coaling altogether.

On June 14, a 37-ship invasion convoy departed Tampa Bay, escorted by battleship *Indiana*. By June 22, Major-General William Shafter's 16,300-strong V Corps was landing east of Santiago at Daiquiri and Siboney. *Texas* and *Indiana* supported the landings by shelling Santiago's coastal batteries. Sampson executed a full-scale bombardment of Santiago on June 26. The US fleet formed into two parallel columns 800 yards apart and began steaming towards the harbor. At 0800hrs, the American columns opened fire. Spanish artillery retaliated with increasing intensity until the US battleships had closed within 1,800 yards. An American observing the Santiago bombardment recalled:

> When the shells hit soft spots and exploded, they sent reddish earth and stones hurtling skyward. Others struck point-blank and burst into radiating fragments, which left thin lines of bluish smoke trailing after them. Sometimes a shell plunged into a huge crevice and exploded out of sight, but in a moment huge boulders that had been loosened would tumble downward into the sea… The terrific impact made the shells glow with heat as they spun upwards into the clouds, or bounded straight back as if seeking to return to the ships from which they had been fired.

Around 0930hrs, Sampson ordered a retirement. *Oregon* and *Massachusetts* had each been struck in the mast by Spanish fire but were otherwise undamaged. One American was wounded.

On July 1, Shafter's V Corps won the heights at El Caney and San Juan Hill. US heavy guns could now be advanced to shell Cervera's squadron in Santiago harbor. Time had run out. Cervera preferred his men to fight on land rather than attempt a suicidal sortie, but Cuba's Governor-General Ramón Blanco ordered Cervera to break out, explaining, "It is better for the honor of our arms that the squadron perish in battle."

At 0530hrs on July 2, the US fleet opened another bombardment of Santiago, drawing return fire for the shelling's two-hour duration. The American highlight was when either *Indiana* or *Oregon* shot away the Spanish flag above Santiago's Morro fortress. Cervera's squadron spent the afternoon of July 2 preparing for action; Santiago's heavily damaged *Reina Mercedes* was to be left behind. The Spanish warships made steam that afternoon, noticed by the Americans offshore. Cervera rejected a nighttime sortie, opting for a daylight attempt.

The following morning, July 3, Cervera's doomed squadron of four Spanish cruisers and two destroyers cleared ship for action and raised battle ensigns. The squadron's desperate mission was to escape, or at least die gallantly. The Americans boasted overwhelming advantages in numbers, firepower, condition, supplies, training, health, and morale. Unfinished *Cristóbal Colón*'s 10in main battery had never been installed, while many of *Vizcaya*'s and *Almirante Oquendo*'s secondary guns were inoperative. Regardless, some 80 percent of Spanish ammunition was defective. Spanish sailors were exhausted; most had been fighting ashore for weeks. Despondent over their chances, many now chose to meet their fate drunk. "*¡Pobre España!*" (Poor Spain!) blurted *Infanta Maria Teresa*'s captain as the flagship surged towards the harbor mouth.

Crewmen of the battleship *Iowa* watch the battle of Santiago unfold off the coast of Cuba, July 3, 1898. Dense gun smoke and several ships are visible. The original photograph was from Naval Cadet Cyrus R. Miller's journal. (NHHC NH 1132)

At 0845hrs, Sampson's flagship, *New York*, headed east to confer with Shafter at Siboney, leaving Schley in tactical command aboard cruiser *Brooklyn*. Additionally, the battleship *Massachusetts* and cruisers *Newark* and *New Orleans* had retired overnight to Guantánamo Bay. From west to east, the US blockade comprised gunboat *Vixen*, cruiser *Brooklyn*, battleships *Texas*, *Iowa*, *Oregon*, and *Indiana*, and finally gunboat *Gloucester*. Alone among the US warships, Captain Clark had maintained all *Oregon*'s boilers in operation throughout the blockade.

American lookouts noticed smoke approaching the Santiago harbor mouth at 0935hrs. As Cervera's *Infanta Maria Teresa* appeared, *Iowa* fired a 6-pdr eastward to alert Sampson. *New York* immediately turned about at flank speed. Within 12 minutes, the Spanish cruisers emerged single-file at 800-yard intervals: *Infanta Maria Teresa*, *Vizcaya*, *Cristóbal Colón*, and finally *Almirante Oquendo*. "Go straight for them!" Schley barked. The Americans aggressively charged the harbor mouth as both fleets opened fire, the Spanish supported by Santiago's coastal artillery.

Still smoking, Spanish cruiser *Almirante Oquendo* lies aground shortly after the Santiago battle. She lost 80 men killed, including her captain. Although too damaged to be fully salvaged, three of *Almirante Oquendo*'s 5.5in guns were recovered and remain on display in the United States. (Murat Halstead/Public domain)

Cervera had planned to sacrifice himself and *Infanta Maria Teresa* by ramming Schley's *Brooklyn*, praying his remaining ships could escape in the confusion. By 1005hrs, *Brooklyn* and *Infanta Maria Teresa* were on a head-on collision course 600 yards apart. *Brooklyn* sheered hard to starboard, inadvertently cutting across the bow of the charging *Texas*. In desperation, *Texas* put her engines full astern, avoiding the wildly maneuvering *Brooklyn* but losing headway. In evading *Brooklyn*, battleships *Texas*, *Oregon*, and *Iowa* appeared headed for a disastrous three-way collision, but frantic maneuvering averted catastrophe. As the fleets merged, a shooting melee ensued. "There is little doubt," an *Indiana* officer recalled, "that every American vessel at some point in the engagement fired at each of the Spanish ships."

In the chaos, Cervera's cruisers turned west and suddenly found themselves in front of the Americans. The battle was to be a westerly stern chase parallel to the Cuban coast. The Spanish fell into line ahead as the Americans raggedly pursued, settling onto individual parallel courses roughly 1 mile seawards of Cervera's cruisers. Though theoretically faster than the US battleships, Cervera's squadron was saddled with deficient coal, poorly maintained machinery, and badly fouled bottoms. A furious running shoot-out ensued. *Brooklyn* regained the American lead, followed by the hard-charging *Oregon* coming on with "a tremendous bone in her mouth," recalled Schley.

Cevera's cruisers had already received moderate damage during the initial melee, including destroyed steam pipes and fires aboard *Infanta Maria Teresa*, courtesy of two 12in *Iowa* shells. Mixed batteries blazed back and forth on flat trajectories. Captain Evans, exposed on *Iowa*'s open bridge, recalled *Iowa* being "fairly smothered ... with a shower of shells and machine gun shot," but observed Spanish armor was "just thick enough to explode our shells with the most disastrous effect." Although continuing to race west, by 1015hrs *Infanta Maria Teresa* was uncontrollably ablaze. With ammunition detonating from the rising heat, Cervera ordered *Infanta Maria Teresa* aground, striking her colors and flooding her magazines at 1035hrs.

Iowa now raced 1,600 yards off the port quarter of the fleeing *Almirante Oquendo*, followed by *Oregon* and *Indiana*. The three battleships poured fire into the Spanish cruiser. A Spanish shell then cooked off prematurely in the breech of one of *Almirante Oquendo*'s 5.5in guns, massacring the entire gun crew. *Almirante Oquendo* suffered 43 hits from 8in, 4in, and 6-pdr guns,

Oregon is seen charging west after *Cristóbal Colón* at midday, July 3, 1898, in this Fred Pansing oil painting. Risking damage to his own ship, Captain Clark commenced firing *Oregon*'s forward 13in guns at their maximum elevation of 30 degrees, encouraging his own men and demoralizing the Spaniards, still miles ahead. (Superstock/ Getty Images)

slaughtering most Spaniards topside. After her boilers exploded, *Almirante Oquendo* scuttled herself at 1030hrs, half a mile west of *Infanta Maria Teresa*, a "magnificent, sad sight," wrote Evans. Minutes later, *Almirante Oquendo*'s magazine detonated.

Spanish destroyers *Pluton* and *Furor* emerged from Santiago harbor 1,200 yards behind *Almirante Oquendo* just as the American battleships were passing at 1030hrs. Multiple secondary battery broadsides from *Oregon*, *Iowa*, and *Indiana* riddled both destroyers. Unnoticed amongst the heavy battleship fire, tiny gunboat *Gloucester* closed to point-blank range, "automatic guns blazing," driving *Pluton* aground at 1045hrs and sinking *Furor* five minutes later.

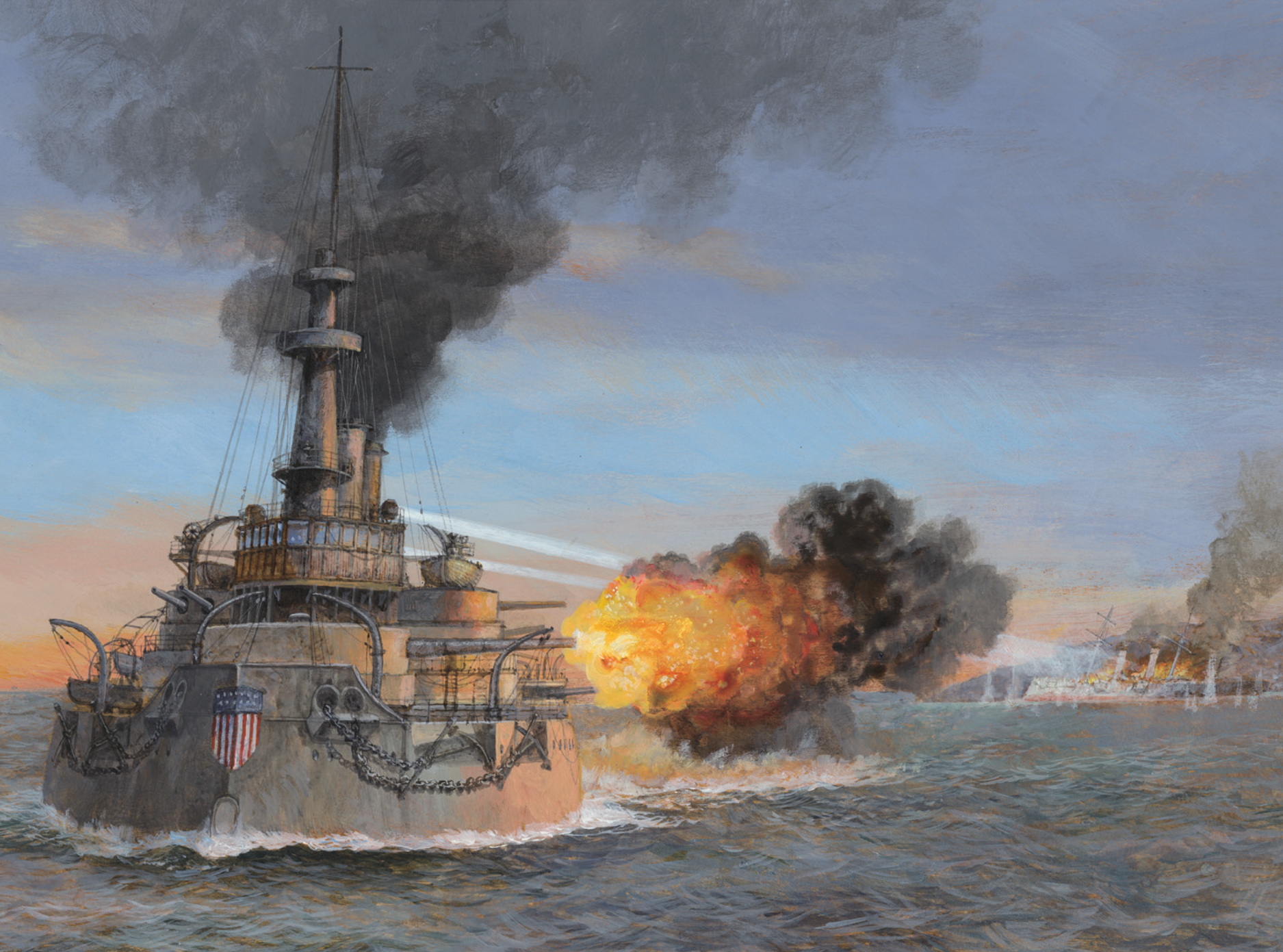
Oregon pulled abeam *Vizcaya* and the two engaged in a running gunfight from 2,500 yards, with *Vizcaya* "blazing away viciously," according to *Texas*' Captain J.W. Phillips. *Brooklyn*, *Texas*, *Indiana*, and *Iowa* all concentrated their fire on *Vizcaya*. Shortly after 1100hrs, *Vizcaya* unpredictably sheered to port. Almost immediately, an 8in shell struck *Vizcaya* forward and lit off a forward torpedo tube. *Vizcaya* erupted in a massive explosion, tearing much of her bow apart. A second 8in shell wrecked *Vizcaya*'s bridge. Fires began to rage, spreading throughout the cruiser via her heavy wood furnishings. *Vizcaya*'s 5.5in ammunition began detonating. A raging inferno, *Vizcaya* turned towards the coast at 1106hrs, "like some sick and wounded thing, seeking a place to die," according to *Oregon*'s Clark. *Vizcaya* ran aground and exploded twice, prompting American cheers. *Texas*' Captain Phillips admonished his crew: "Don't cheer, men! Those poor fellows are dying!" As *Iowa* swept past *Vizcaya*, Captain Evans observed, "The Cuban insurgents had opened fire on the survivors from the shore … and I could plainly see the bullets snipping up the water among them. The sharks, made ravenous by the blood of the wounded, were attacking them from the outside." Evans dispatched an armed boat ashore, threatening that the Americans would fire on any insurgents who attacked the Spaniards.

Iowa suffered two hits from *Cristóbal Colón* and a fire subsequently erupted below decks, threatening the battleship's magazines. It was put out by Fireman Robert Penn, who was awarded the Medal of Honor for his efforts. Limited to 10 knots by boiler repairs, *Iowa* began falling behind. By now, trailing US warships began hauling exhausted and filthy Spanish survivors from the water, many burned and wounded, their uniforms shredded. Captain Evans recalled: "Admiral Cervera was transferred from the *Gloucester* to my

G

BATTLESHIP USS *MASSACHUSETTS* SHELLS SPANISH CRUISER *REINA MERCEDES* OFF SANTIAGO DE CUBA, JULY 4, 1898

After Cervera's squadron was destroyed, the Spaniards chose to sink heavily damaged cruiser *Reina Mercedes* in the Santiago harbor channel as a blockship. Late on the evening of July 4, *Reina Mercedes* emerged into the searchlights of night duty battleship *Massachusetts*, which promptly opened fire. Nearby *Texas* also unleashed her main battery, and *Reina Mercedes* was caught in the point-blank crossfire of the two American battleships, seen here. Within minutes *Reina Mercedes* had been riddled by US shells, receiving at least three 13in/35-caliber and two 12in/35-caliber main battery hits. *Reina Mercedes*' crew detonated their scuttling charges, but the Spanish cruiser drifted off-course and sank outside the main channel.



The exhausted men of battleship *Oregon* cheer moments after the last Spanish cruiser, *Cristóbal Colón*, ran herself aground and struck her colors 50 miles west of Santiago on July 3, 1898. Among *Oregon*'s complement was engineer cadet William D. Leahy, future chairman of the Joint Chiefs of Staff during World War II. (NHHC NH 1110)

ship. When he stepped on the main deck he was received with all honors according to his rank by my whole staff. The crew of the *Iowa* together with the ones from *Gloucester* broke into a 'hurrah!' when the Spanish Admiral saluted the American officers." *Vizcaya*'s Capitán Don Antonio Eulate offered his sword to Evans, who refused it. Eulate turned and shouted, "*¡Adios, Vizcaya!*" Almost on cue, *Vizcaya*'s forward magazine exploded. Evans turned and helped Eulate below to Evans' own cabin.

Far over the western horizon, the battle's final act remained to play out. *Cristóbal Colón* was now alone, fleeing desperately west at 15 knots. She had opened a 6-mile lead over the doggedly-pursuing *Brooklyn* and *Oregon*. *Brooklyn* signaled *Oregon*, "She seems built in Italy," prompting Clark's response, "She may have been built in Italy but she will end on the coast of Cuba." *Cristóbal Colón*, having burned her best coal early, began to falter. *Oregon*, burning high-quality Cardiff coal saved for battle, began closing. At extreme long range, *Oregon* finally unleashed her forward 13in guns at 1220hrs, inspiring exhausted stokers below. As the minutes passed, *Brooklyn* and *New York* closed within 8in range and commenced firing. *Cristóbal Colón* responded with her single operable 6in gun, but she was fading fast. *Oregon*, *Texas*, *Brooklyn*, and *New York* pulled within one mile. At 1312hrs, a 13in shell from *Oregon* scored a near-miss just beneath *Cristóbal Colón*'s stern and rounds "began to strike ahead and on all sides" of the fleeing cruiser. Ahead, the Cuban coast jutted sharply seawards. *Cristóbal Colón* had yet suffered only minor damage but, hemmed in by two battleships and two cruisers, there was no longer any hope of escape. *Cristóbal Colón* struck her colors and ran aground at the mouth of the Rio Tarquino, 50 miles west of Santiago. "*¡Bravo, Americanos!*" cried the Spaniards as Schley's boarding party pulled alongside. "*¡Bravo, Españoles!*" responded the Americans. The Spanish cruiser capsized the following morning; the only casualty was *Oregon*'s national ensign flying from *Cristóbal Colón*'s mast.

Cervera's utterly outmatched fleet had been annihilated. The Americans had registered only 123 confirmed hits out of 9,433 rounds, a rate of 1.3 percent; American ships generally had to close within 2,000 yards to score, while battle ranges had sometimes fallen inside 1,000 yards. Sampson's fleet had suffered strikingly light damage; casualties were one killed and ten wounded. The Spanish had lost all six warships and 323 killed. Some 1,904 Spaniards were taken prisoner, many severely wounded.

A weather-beaten *Massachusetts* is seen in New York during the August 1898 victory review. She flies two large national ensigns from her masts and still sports wartime gray paint. Her crew is wearing tropical white uniforms. The battleships escaped Cuba just as yellow fever began decimating V Corps. (NARA)

The Santiago blockade was re-established within hours. On the late evening of July 4, *Massachusetts* observed cruiser *Reina Mercedes* emerging; the Spanish had decided to

scuttle her in the channel. *Massachusetts* and *Texas* opened fire on *Reina Mercedes* at point-blank range, scoring at least five 13in and 12in hits. *Reina Mercedes* sank as the Spanish had planned, but like *Merrimac* she also sank outside the main channel. The US battleships would make additional long-ranged bombardments of Santiago on July 10–11. Santiago's beleaguered Spanish garrison formally capitulated to Shafter's V Corps on July 17. The Spanish government accepted United States terms on August 7, essentially ending the Spanish-American War. The Philippines, Puerto Rico, Guam, and Hawaii had tumbled into American hands that summer. For the United States it had been a "splendid little war," and the battleships' performance was a major reason why. On August 14, *Iowa*, *Massachusetts*, *Indiana*, *Oregon*, *New York*, and *Brooklyn* departed Cuba for New York. They received a tumultuous welcome when they arrived on August 20.

The Pacific and Asiatic 1898–1900

Monitors *Monterey* and *Monadnock* had departed California for Manila Bay that June. Their mission was to counter the Armada Española's battleship *Pelayo* and armored cruiser *Emperador Carlos V*, recently sortied from Cádiz. *Monterey* arrived at Manila on August 10 and *Monadnock* on August 16. By then the Spanish squadron had aborted and the war was over. The United States immediately annexed the Philippines over their erstwhile Filipino allies' protests, leading to the Philippine-American War. At the February 1899 battle of Caloocan, *Monadnock* would shell Filipino targets in support of Major-General Arthur MacArthur's 2nd Division. Battleship *Oregon* shortly followed the monitors to Manila; upon her March 18, 1899 arrival she became the new Asiatic Squadron flagship. That September, *Monterey* bombarded Filipino insurgents on Luzon before landing a party that secured Subic Bay's Olangapo. *Monterey* and *Monadnock* would spend the rest of their careers patrolling Southeast Asian waters with the Asiatic Squadron, never returning to the United States.

In China, long-simmering resentment against foreign encroachment had reached an inevitable tipping point. By May 1900, attacks and riots by a xenophobic secret society called the "Boxers" had swelled into open rebellion against the foreign community in Peking. The Boxers moved aggressively against the multinational Foreign Legation, winning the tacit approval of the Imperial Chinese government. On May 31, an expedition of 28 *Oregon* marines, five *Oregon* bluejackets, and 27 *Newark* marines under *Oregon*'s Captain John "Handsome Jack" Myers (US Marine Corps) were

BELOW LEFT
Monitor USS *Monadnock* (BM-3) seen crossing the Pacific en route to the Philippines in summer 1898. She and collier USS *Brutus* departed San Francisco on June 23, arriving at Manila Bay via Hawaii on August 16. The successful trans-Pacific transfers of *Monadnock* and *Monterey* were a remarkable operational achievement. (NHHC NH 60659)

BELOW RIGHT
Monitor USS *Monterey* (BM-6) plows through the Pacific en route to the Philippines in summer 1898. A contemporary newspaper described the monitors as "slow-going, creepy monsters," but was satisfied they would handle the Spanish squadron bearing down on Manila Bay. (US Navy)

Battleship *Oregon* aground on a submerged pinnacle in the Chang-Sun Channel, three miles south of the Now-Ki Island Light off China's Shantung Peninsula, June 29–July 2, 1900. (NHHC NH 42970)

A stern view of *Oregon* at Mare Island's Drydock No. 2, September 1917. *Oregon*'s original mainmast has been replaced with the distinctively American cage mast. With the exception of the Spanish-American War, *Oregon* served her entire career in the Pacific and Asiatic. (US Navy)

rushed into Peking to help defend the Foreign Legation from rioting Boxers. They were joined by 370 marines and sailors from Britain, France, Germany, Austria, Italy, Russia, and Japan. By June 6, the Boxers had cut all links to Peking and the Foreign Legation was under siege. After days of demonstrations and riots, on June 20 the Imperial Chinese government quite unrealistically demanded the foreigners exit Peking. Chinese troops attacked the following day.

Within the Foreign Legation compound, Myers' marines defended the American Legation inside the 60ft high Tartar Wall. Sir Claude MacDonald, de facto commander of the Allied defense, later wrote, "Captain Myers' post on the wall was the peg that held the whole thing together." By June 27, the Chinese began several days of daylight attacks, overrunning German lines on July 1. The *Oregon* and *Newark* marines counterattacked and partially retook the German positions, but the following day the Chinese greatly strengthened their own defenses on the Tartar Wall. On July 3, Myers counterattacked with 30 of his marines and 41 Britons and Russians. Although Myers was wounded and two US marines killed, the operation was a total success, claiming the newly constructed Chinese barricades and arguably turning the tide of the siege. On July 7, an *Oregon* bluejacket got an ancient junk cannon operational. Affectionately nicknamed both "Betsy" and "The International," the resurrected cannon and the marines' Colt-Browning M1895 machine gun provided much of the Allies' defensive firepower. By July 16, the siege had settled down into modest sniping. On August 14, an 18,600-man international relief force finally lifted the siege. The original *Oregon* and *Newark* detachment of 60 men had lost 17 killed and wounded but had played a critical role in defying the Boxer Rebellion.

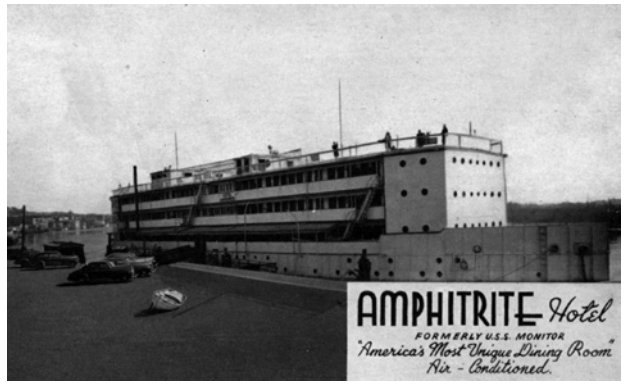
Meanwhile, *Oregon* had departed Hong Kong for Taku on June 23 to dispatch additional US marines and bluejackets to reinforce Peking's Foreign Legation. However, on June 29 *Oregon* grounded severely on an underwater pinnacle three miles off China's Shantung Peninsula. *Oregon*'s hull was torn open and her forward compartments flooded, putting her survival in peril. After foreign help arrived, *Oregon* was refloated on July 2. Denied the use of Russia's nearby Port Arthur, *Oregon* limped to Japan's Kure drydock on July 17 for temporary repairs before returning to San Francisco in 1901.

Twilight careers 1903–56

The turn of the 20th century proved a period of extraordinary technological progress. Although just a few years in commission, it was apparent the best days of the Spanish-American War battleships and monitors were behind them. Yet the obsolescent warships still had diverse and crucial roles to play in a rapidly ascending US Navy.

Oregon's dramatic 1898 voyage finally motivated the US government to build a Central American canal,

however possible. The dubious Hay-Herrán Treaty of January 22, 1903, authorized the United States canal rights across Colombia's Panamanian isthmus, but the deal was rejected by the Colombian senate. Prodded by President Theodore Roosevelt, Panamanian separatists declared independence on November 3. Monitor *Wyoming* arrived off Panama's Pacific coast on November 13, 1903, then steamed up the Tuira River and landed a marine company. By November 18, the United States and Panamanian insurgents had signed the Hay-Bunau-Varilla Treaty guaranteeing Panamanian independence and perpetual US rights to a canal. Through her gunboat diplomacy, *Wyoming* and her landing parties helped consolidate local American hegemony into April 1904.



The floating Amphitrite Hotel docked at Georgetown, South Carolina, as depicted on a 1930s postcard. The former *Amphitrite* boasted air conditioning but was advertised as "formerly U.S.S. *Monitor*." With her guns and armor removed, *Amphitrite* rides high in the water. (Author's collection)

In March 1908, *Wyoming*'s sister *Florida* began experiments to determine potential muzzle blast issues for the upcoming South Carolina-class dreadnoughts. *Florida* successfully demonstrated that armored hoods and turret crews would remain unharmed by end-on superfiring muzzle blasts. Between May 21 and June 19, *Florida* tested the efficacy of cage masts. Her stern was fitted with a prototype cage mast that was weighted 4 tons and inclined 10 degrees to simulate the roll of a battleship at sea. Heavy battery rounds were then fired into it. Holed numerous times, the riddled, inclined lattice mast showed no signs of collapsing. The cage mast was subsequently adopted by the USN, becoming a distinctive feature of American battleships through World War II.

In 1907, *Wyoming* had been taken under refit at Mare Island, re-emerging in October 1908 as the first USN ship to burn fuel oil instead of coal. *Wyoming* was duly recommissioned to serve as a propulsion testbed. Most of her coal bunkers were converted into fuel tanks, providing a fuel oil capacity of 60,816 gallons. Successful testing of fuel oil propulsion proceeded on the West Coast until June 1909.

Remote control drone *Coast Battleship No. 4* (ex-*Iowa*) exits the Panama Canal's Pedro Miguel Lock and enters Miraflores Lake en route to the Pacific, February 10, 1923. Her cage mast was fitted in 1908. (NH 73816)

By World War I, the Arkansas-class had been converted into submarine tenders. Through most of 1914, *Ozark* (ex-*Arkansas*) would patrol off Mexico during the Veracruz occupation. *Tonopah* (ex-*Nevada*) would be forward-deployed to the Azores in February 1918, where she attended USN submarines *K-1*, *K-2*, *K-3*, *K-5*, and *E-1* performing antisubmarine warfare patrols. Although no U-boats were sunk, attacks on Azores-area shipping ceased the week that *Tonopah* and her submarines arrived. The monitors spent their twilight years training reservists and naval militia. All

Beginning December 7, 1942, *Oregon* was dismantled into an ammunition barge and redesignated *IX-44*. In July 1944, she was ballasted with gravel, loaded with 1,500 tons of explosives, and towed to Guam, where she briefly came under Japanese fire. The ship is seen under tow in 1944. (US Navy)

"Celebrating July 4, 1898: The triumph of the American battleship." In this 1898 *Puck* political cartoon, a proud Uncle Sam displays his Santiago-triumphant navy to an approving John Bull. Behind them, European powers observe the ascending Americans with concern. Spain can no longer bear to watch. (Universal History Archive/UIG via Getty Images)

but *Cheyenne* (ex-*Wyoming*) were disposed of by 1923. *Cheyenne* survived as a training ship until 1926 and was struck in 1937. The monitors were generally scrapped, but *Amphitrite* was sold in 1920 and converted into a floating hotel. She operated at a succession of Southern coastal tourist traps until her 1952 demolishing.

As Pacific Fleet flagship, *Oregon* represented the USN at San Francisco's 1915 Panama-Pacific International Exposition and at Portland, Oregon's 1916 Rose Festival. The following year, *Oregon* and gunboat *Vicksburg* were assigned to escort the American Expeditionary Force Siberia to Vladivostok, but they were dismissed of their mission in August 1917 by Major-General William Graves, who wanted the transport *Thomas* to depart San Francisco immediately.

The battleships were disposed of by employing them as ordnance targets. *Texas* was decommissioned in February 1911, renamed *San Marcos*, and sunk by gunfire in 20ft Chesapeake Bay waters that October; *Texas*' exposed superstructure survived as a gunnery target through World War II. *Indiana* was renamed *Coast Battleship No. 1* and sunk by aerial bombing in 1920. The following year, *Coast Battleship No. 2* (ex-*Massachusetts*) was scuttled off Pensacola for Army use as a coastal artillery target. She remains a popular diving spot. *Coast Battleship No. 4* (ex-*Iowa*) was converted into a sophisticated radio-controlled target ship and sunk by gunfire during the March 23, 1923, fleet battle practice off Panama. The USN loaned *Oregon* to her eponymous state in June 1925, where she was restored to superb condition and moored in Portland as a floating museum on the Willamette River. On November 2, 1942, *Oregon* unnecessarily fell victim to the American scrap metal drive hysteria, President Franklin Roosevelt having chosen Philadelphia's dilapidated *Olympia* to be the nation's designated Spanish-American War survivor. After numerous court cases, *Oregon*'s partially scrapped hulk was towed to Guam in July 1944 for use as an ammunition barge for Operation *Forager*. She came adrift during a typhoon on November 14–15, 1948, and on December 8 was located 500 miles southeast of Guam before being towed back. After several more sales, strippings, and partial scrappings, *Oregon* was finally towed to Kawasaki, Japan, and fully scrapped in 1956.

CONCLUSION

The United States' first battleships appeared at the exact moment the American frontier closed and the

400-year conquest of North America was complete. Congressional insistence on building its new navy at home directly catalyzed what would become the most powerful economy in history. The state-of-the-art technology required to manufacture battleship ordnance ultimately found its way to previously unimagined civilian applications, most portentously skyscraper construction. As the United States entered a new era of prosperity and nationalism, the victorious Spanish-American War battleships became patriotic symbols for government and public to rally around. While probably not equivalent to their British contemporaries, US battleships and their well-trained crews proved quite sufficient to dispatch an overextended third-rate power such as Spain, winning the most sudden overseas empire of the 19th century. Ultimately, this short-lived first generation of US battleships directly conceived a world-class American manufacturing base, enabled a permanent shift in American foreign policy, and laid the foundations of the modern US Navy.

SELECT BIBLIOGRAPHY

Alden, John D., Commander, US Navy (Retired), *The American Steel Navy*, Naval Institute Press, Annapolis, Maryland (1972)

The American Iron and Steel Association, *History of the Manufacture of American Armor Plate for the United States Navy*, American Iron and Steel Association, Philadelphia (1899)

Baer, George W., *One Hundred Years of Sea Power: The US Navy 1890–1990*, Stanford University Press, Stanford, California (1993)

Bennett, Frank M., *The Monitor and the Navy under Steam*, Houghton, Mifflin and Company, The Riverside Press, Cambridge, MA (1900)

Cooling, Benjamin Franklin, *Gray Steel and Blue Water Navy: The Formative Years of America's Military-Industrial Complex 1881–1917*, Archon Books, North Haven, Connecticut (1979)

Cowan, Mark D. & Sumrall, Alan K., *"Old Hoodoo" The Battleship Texas: America's First Battleship 1895–1911*, self-published (2011)

Friedman, Norman, *U.S. Battleships: An Illustrated Design History*, Naval Institute Press, Annapolis, Maryland (1985)

-----, *US Naval Weapons: Every gun, missile, mine and torpedo used by the US Navy from 1883 to the present day*, Naval Institute Press, Annapolis, Maryland (1983)

Leeke, Jim, *Manila and Santiago: The New Steel Navy in the Spanish-American War*, Naval Institute Press, Annapolis, Maryland (2009)

Nofi, Albert, *The Spanish-American War, 1898*, Da Capo Press, Cambridge, MA (1997)

Reilly, John C. & Scheina, Robert L., *American Battleships 1886–1923: Predreadnought Design and Construction*, Naval Institute Press, Annapolis, Maryland (1980)

Sternlicht, Sanford, *McKinley's Bulldog: The Battleship Oregon*, Burnham Inc, Chicago (1977)

www.eugeneleeslover.com
www.navsource.com
www.navweaps.com
www.spanamwar.com

INDEX

References to images are in **bold**.

Almirante Oquendo (ship) 34, 38, 39–40
Amphitrite, USS 7, 12, **13**, 15, 34, 36, 46
Aquidabã (ship) 5
Arapiles (ship) 4
Arkansas, USS 17
Arkansas class 16–17
Armada Española 34
armor 7–8, 22, 26
armored cruisers 17–18
auxiliary engines 8–9

batteries 9, 20, 25–26
belts 26
Bethlehem Iron 7
Blanco, Ramón 38
Blandin, Lt John 32
boilers 22, 26, 29
Boxer Rebellion (1899–1901) 43–44
Brazil 4–5
Brooklyn, USS 38, 39, 42

cage masts 45
Carnegie Steel 7
Cervera y Topete, Contraalmirante Pascual 34, 36, 38, 39
Cheyenne, USS 17, 46
Chile 4–5
China 43–44
Cincinnati, USS 34
Clark, Capt Charles 33, 34, 38
coal bunkers 33, 45
Coast Battleship No. 4, USS **45**
Colombia 45
commerce raiding 6
communications 9
Connecticut, USS 17
Cristóbal Colón (ship) 34, 38, 39, 40, 42
Cuba 32, 33, 34, 36–39, 42–43

Devastation, HMS 6
Douglas, A. D. Bryce 22

electricity 9
Emperador Carlos V (ship) 43
engines 8–9, 22, 29
Esmeralda (ship) 5
Eulate, Capt Don Antonio 42
Evans, Capt Robley "Fighting Bob" 36, 37, 40, 42
Expeditionary Force Siberia 46

Fiske, Bradley 9
Florida, USS 17, 45
Foreign Legation 43, 44
Furor (ship) 34, 40

Gloucester, USS 38, 40, 42
Graves, Maj-Gen William 46
Guam 46
Guantánamo Bay 37
gun forging 6–7
Gun Foundry Board 6–7
gunpowder 10

Harvey steel 7
Hay-Herrán Treaty (1903) 45
Herbert, Hilary A. 4
Hobson, Lt J.G. 36
Howell, Lt Cmdr John 10
Hunt, William H. 5, 12, 14

Indiana, USS **6**, 8, 9, 25–26, **27**, 28
  and sinking 46
  and Spanish-American War 34, 36, 37, 38, 39–40
Infanta Maria Teresa (ship) 34, 38, 39
Iowa, USS 36, 38, 39–40, 46

John, William 21–22

Kimball, Lt William 33

lighting 9
Luce, Cmdre Stephen 5

MacDonald, Sir Claude 44
Mahan, Alfred Thayer 6
Maine, USS 7, 17, **18–19**, 20–21, **23** (22)
  and disaster 32–33
Marblehead, USS 37
Massachusetts, USS **7**, 9, **10**, 25, 46
  and Spanish-American War 36, 38, **41** (40), 42–43
Mayflower, USS 36
Merrimac, USS 36
Mexico 45
Miantonomoh, USS 12, 34
Michigan, USS 25
Monadnock, USS 7, 12, 15, 43
Monitor, USS 11
monitors 8, 11–12, **13**, 14–16, 45–46
Monterey, USS 16, 43
Murphy, J.C. 36
Myers, Capt John "Handsome Jack" 43–44

Naval Policy Board 24–25
Naval War College (NWC) 5
Nevada, USS 17
New Navy 5–6
New Orleans, USS 36, 38
New York, USS 34, 36, 38, 39, 42
Newark, USS 38, 43–44
Nixon, Lt Lewis 25
North Atlantic Squadron 33, 34, **35** (34)

Office of Naval Intelligence 5
oil 45
Olympia, USS 46
Oregon, USS **8**, **10**, 25, **26**, 46
  and Boxer Rebellion 43–44
  and Spanish-American War 33–34, 37, 38, 39–40, 42
Ozark, USS 17, 45

Panama Canal 44–45
Panther, USS 37
Pelayo (ship) 43
Philippine-American War (1899–1902) 43
Pluton (ship) 34, 37, 40
Porter, USS 36
Puritan, USS 7, 8, 12, **13**, 14, 34

ramming 20
Reina Mercedes (ship) 36, 38, **41** (40), 42–43
Riachuelo (ship) 4, 5, 6
Rickover, Adm Hyman 33
Robeson, George 12
Roosevelt, Franklin 46
Roosevelt, Theodore 45
Royal Navy 4, 6

Sampson, Rear Adm William T. 32, 33, 36–38
San Juan (Puerto Rico) **35** (34), 36
Santiago de Cuba 36–39, 42–43
Schley, Cmdre Winfield Scott 33, 38, 39
Schneider-Creusot 7
Shafter, Maj-Gen William 37, 38
Sigsbee, Capt Charles Dwight 32
Spain 4
Spanish-American War (1898) 33–34, **35**, 36–40, **41**, 42–43, 46
steel 7
stoking **9**
submarines 45

Tallahassee, USS 17
Tartar Wall 44
Terror (Spanish ship) 34, 36
Terror, USS 7, 12, 15, 34, **35**, 36
Texas, USS 7, 17, 20, 21–22, **23**, 24
  and decommission 46
  and Spanish-American War 37, 38, 39, 42
Thomas, USS 46
Thompson, Richard W. 12
Tonopah, USS **16**, 17, 45
torpedoes 10
Tracy, Benjamin F. 6, 7, 25
turrets 9, 10, 16, 20, 22, 25, 26

United States Navy (USN) 4–8, 24–25
  V Corps 37–38

ventilation 9
vertical triple-expansion (VTE) 8, **9**
Vicksburg, USS 46
Virginius, USS 4, 11
Vixen, USS 38
Vizcaya (ship) 34, 38, 39, 40, 42
Vreeland, Rear Adm Charles E. 33

War of the Pacific (1879–83) 4
weaponry 9–11, 22, 25–26, 29, 44
Whitehead, Robert 10
Whitney, William Collins 17
Whitworth Company 7
Wilson, Theodore D. 20
World War I (1914–18) 45
Wyoming, USS **13** (12), 17, 45

Yankee, USS 37

OSPREY PUBLISHING
Bloomsbury Publishing Plc
PO Box 883, Oxford, OX1 9PL, UK
1385 Broadway, 5th Floor, New York, NY 10018, USA
E-mail: info@ospreypublishing.com
www.ospreypublishing.com

OSPREY is a trademark of Osprey Publishing Ltd

First published in Great Britain in 2019

© Osprey Publishing Ltd, 2019

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage or retrieval system, without prior permission in writing from the publishers.

A catalog record for this book is available from the British Library.

ISBN: PB 9781472835024; eBook 9781472835031;
ePDF 9781472835048; XML 9781472835017

Index by Zoe Ross
Typeset by PDQ Digital Media Solutions, Bungay, UK

Artist's note

Readers may care to note that the original paintings from which the battlescene plates in this book were prepared are available for private sale. All reproduction copyright whatsoever is retained by the Publishers. All inquiries should be addressed to: p.wright1@btinternet.com

The Publishers regret that they can enter into no correspondence upon this matter.

Osprey Publishing supports the Woodland Trust, the UK's leading woodland conservation charity.

To find out more about our authors and books visit **www.ospreypublishing.com**. Here you will find extracts, author interviews, details of forthcoming events and the option to sign up for our newsletter.

Author's Acknowledgment

I would like to thank the Indiana War Memorials in Indianapolis, Indiana for the photograph of USS *Indiana's* American flag, and also thank its Museum Director, Mr Ethan Wright, for sharing additional information with me about *Indiana* artifacts.